TC-K333ESL/K970ES

SERVICE MANUAL

AEP Model
TC-K970ES
E Model
TC-K333ESL

* Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.

"DOLBY", the double-D symbol ◻◻ and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

Model Name Using Similar Mechanism	TC-K333ESG
Tape Transport Mechanism Type	TCM-200D4

SPECIFICATIONS

Recording system 4-track 2-channel stereo
Fast winding time Approx. 90 sec. (with Sony C-60 cassette)
Bias AC bias
Heads Erasing head × 1 (S&F head)
Recording head × 1 (LA head)
Playback head × 1 (LA head)
Motors Capstan motor × 1
(direct-drive linear torque BSL motor)
Reel motor × 1 (DC motor)
DC motor × 1

Signal-to-noise ratio (at peak level)

Dolby NR switch / Cassette	OFF	B-Type ON	C-Type ON
Type IV (Sony METAL-S)	61 dB	70 dB	76 dB
Type II (Sony UX-S)	59 dB	68 dB	74 dB
Type I (Sony HF-S)	57 dB	66 dB	72 dB

Total harmonic distortion 1.0% (with Sony METAL-S cassettes)
Frequency response (DOLBY NR OFF)

Type IV cassette (Sony METAL-S)	15 - 22,000 Hz (±3 dB,IEC) 15 - 16,000 Hz [±3 dB OVU(-4dB)recording]
Type II cassette (Sony UX-S)	15 - 20,000 Hz (±3 dB,IEC)
Type I cassette (Sony HF-S)	15 - 18,000 Hz (±3 dB,IEC)

Wow and flutter ±0.04% W.Peak (IEC)
0.024% WRMS (NAB)
±0.065% W.Peak (DIN)

Inputs

Line inputs (phono jacks)	Sensitivity	77.5 mV
	Input impedance	47 k ohms
CD DIRECT INPUT	Input impedance	47 k ohms

Outputs

Line outputs (phono jacks)	Rated output level	0,44 V at a load impedance of 47 k ohms
	Load impedance	Over 10 k ohms
Phones (stereo phone jack)	Output level	0 - 2,5 mW at a load impedance of 32 ohms

General
Power requirements 120-220-240V AC, 50/60Hz (AEP, Germany)
220-230V AC, 50/60Hz (E)
Power consumption 31 W
Dimensions Approx. 470 × 140 × 380 mm (w/h/d)
(18⅝ × 5⅝ × 15 inches)
including projecting parts and controls
Weight Approx. 12.0 kg (17 lbs 7 oz)
Model for other countries: Approx. 11.2 kg
Supplied accessory Audio connecting cord (2)
Screws(8)
Wireless remoto control unit*
Sony R6 (Size-AA) batteries (2)*

*Not supplied with model for AEP countrries
Design and specifications subject to change without notice.

使用時は添付資料も参照のこと
Refer to the additional documents.

STEREO CASSETTE DECK
SONY®

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Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

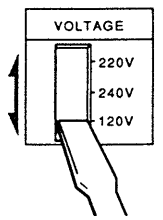
Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270℃ during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

TC-K333ESL : E Model

Operating Voltage

Before connecting the unit to the power source, check that the operational voltage of your unit is the same as the local power supply.

Where purchased	Operating voltage
European countries	220 – 230 V AC, 50/60 Hz
Other countries	120, 220 or 240 V AC adjustable, 50/60 Hz A voltage selector is located on the rear panel. If the selector must be reset, **disconnect the AC power cord** and set the selector to the appropriate voltage.  VOLTAGE selector

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

For higher quality recording/playback

- **The Dolby HX PRO* system** which improves the linearity of the tape's high-range response during recording.
- **Bias and recording level calibration** which ensures optimum recording conditions to bring out the best in every tape.
- **Three-head system (separate recording, playback and erase heads)** which allows you to instantly check the recorded sound while recording is in progress.
- **Professional-level deck design** for high mechanical stability and maximum performance.

For your convenience

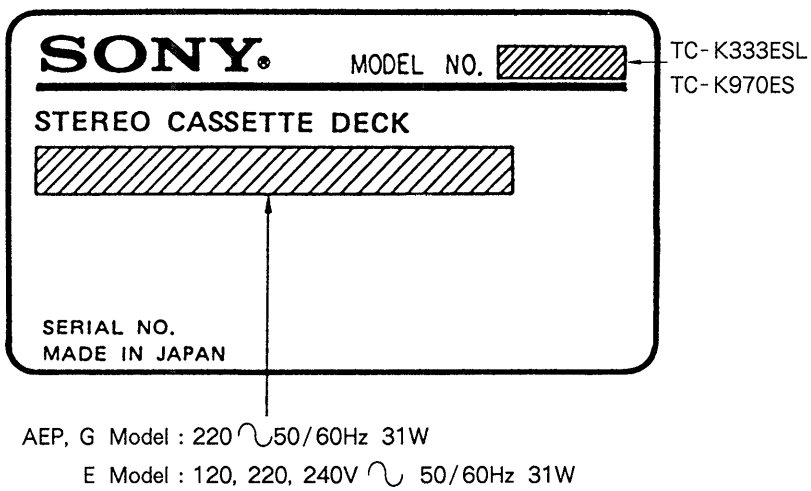
- **The AMS and Memory Play functions** which provide easy access to a desired selection.
- **Timer-activated playback and recording** through the use of an optional timer.

For easier operation

- **Easy-to-read digital linear counter** which shows the elapsed recording or playing time.

MODEL IDENTIFICATION

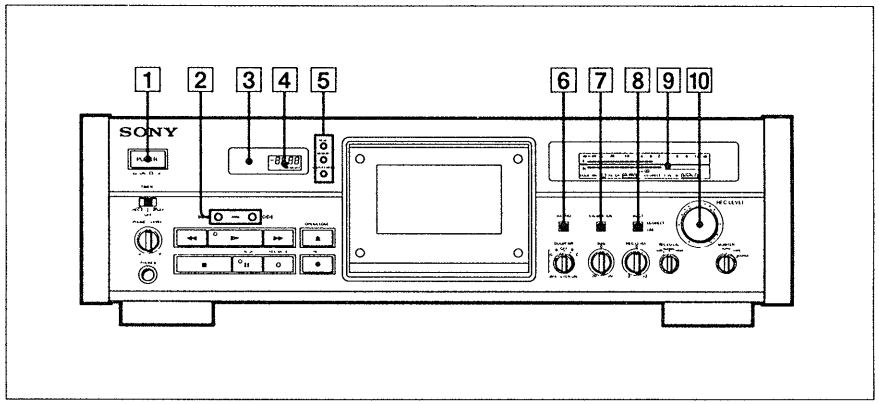
– Specification Label –

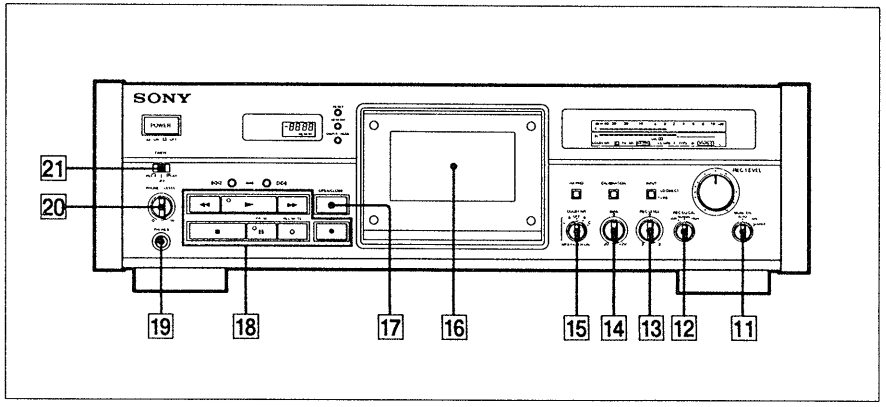


SECTION 1
GENERAL

This section is extracted from instraction manual.

Identification of Front Panel Parts





For details, refer to the page number indicated in ●.

[1] **POWER switch**

[2] **AMS (Automatic Music Sensor) buttons** ㉘

[3] **Remote sensor**
You can remotely control this cassette deck with:
— A remote commander that came with a Sony amplifier or receiver if it has the RM mark and cassette deck control capability.
— An optional Sony remote commander with the RM mark and cassette deck control capability.

[4] **LINEAR COUNTER** ㉜

[5] **Counter buttons**
RESET button ㉚
MEMORY button ㉘ ㉚
DISPLAY MODE button ㉑

[6] **DOLBY HX PRO button** ㉞ ㉟

[7] **CALIBRATION button** ㊶

[8] **INPUT button** ㉞

[9] **PEAK PROGRAM METER** ㊳

[10] **REC (recording) LEVEL control** ㉛ ㊳

(Continued on next page.)

For details, refer to the page number indicated in ●.

(Continued from previous page.)

[11] **MONITOR switch** ㊵

[12] **REC EQ CAL (recording equalizing calibration) switch (LOW, NORMAL, HIGH)** ㊴

[13] **REC (recording) LEVEL control for calibration** ㊷ ㊶

[14] **BIAS control** ㊷ ㊶

[15] **DOLBY NR (noise reduction)/MPX FILTER switch** ㉒ ㉞

[16] **Cassette holder**

[17] **⏏ OPEN/CLOSE button**

[18] **Tape operation buttons and indicators**
◀◀ (rewind) button
■ (stop) button
► (play) button and indicator
►► (fast-forward) button
● REC (recording) button and indicator
❚❚ PAUSE button and indicator
O REC MUTE (record muting) button ㉜

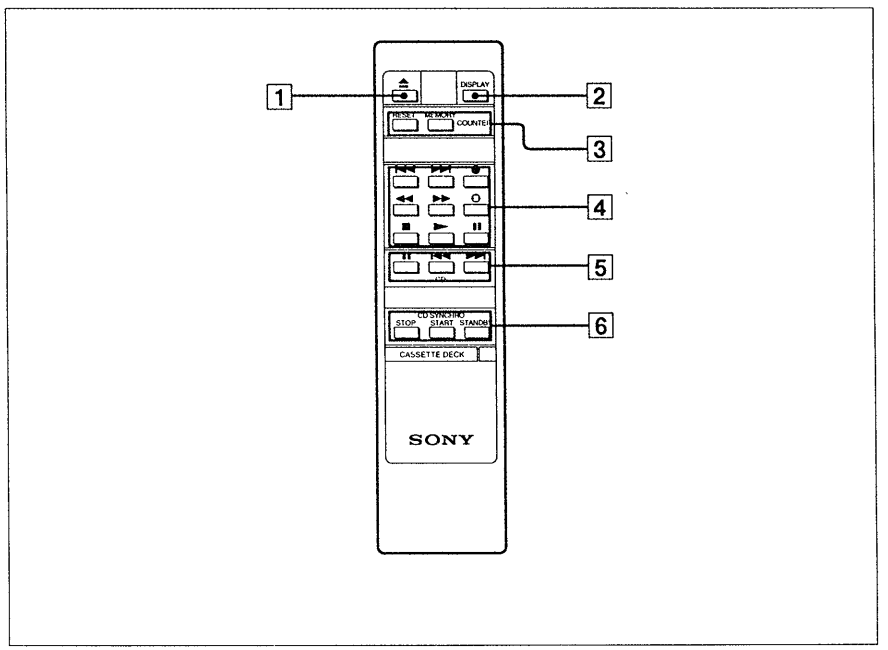
[19] **PHONES jack (stereo phone jack)** ㉑

[20] **PHONE (headphones) LEVEL control**

[21] **TIMER switch** ㉕

Remote Commander

(Except for European model)



The controls on the remote commander are identical in function and operation to those with the same name on the main unit.

For details, refer to the page number indicated in ●.

1 ≜ **(open/close) button**

2 **DISPLAY button**

3 **Counter buttons**

4 **Tape operation buttons**

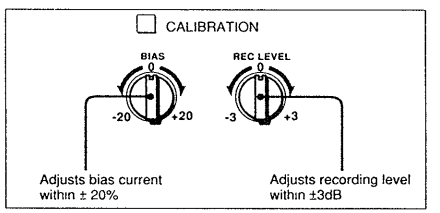
5 **CD (Compact Disc) buttons**
for controlling Sony CD players
II (pause) button
I◄◄ / ►►I buttons for locating selections sequentially

6 **CD SYNCHRO buttons**
for synchronized recording with a Sony CD player

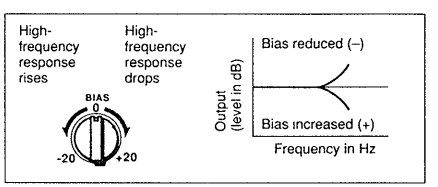
Making an Optimum Recording According to the Tape Type

Bias and Recording Level Calibration

There are many different types of cassettes on the market, each with varying magnetic properties. Although your unit is equipped with the ATS (Automatic Tape Selection) system which sets the appropriate equalization characteristics and bias current for each tape type, an additional calibration adjustment can often produce even better results. Use the bias current and recording level calibration function to obtain the optimum recording conditions for your tape.



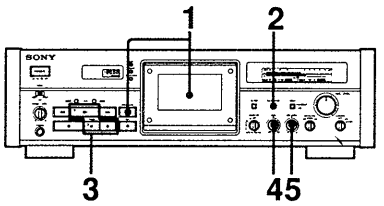
Bias calibration
Choosing the optimum bias current for a tape ensures minimum distortion and flat frequency response. Lowering the bias current boosts high-frequency response, but also results in higher distortion. Raising the bias, on the other hand, reduces distortion, but also dampens high-frequency response. Optimum bias is thus obtained when the bias current and high-frequency response are well balanced.



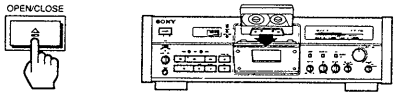
- If the bias current is higher or lower than the optimum setting for a certain tape, the frequency response changes as shown in the chart above. Changing the bias can thus be used to tailor the response to your liking, for example by slightly emphasizing the upper or lower end.
- The frequency response of metal tapes is much less affected by changes in the bias current than other tape types. With some tapes, the adjustment range of this deck (±20%) may therefore not be sufficient to cover every possible requirement.

Recording level calibration
Even when the recording level is adjusted correctly, using a tape with low sensitivity will result in a low playback level. The REC LEVEL calibration control allows you to compensate for sensitivity differences among tapes to equalize both recording and playback levels. This is especially important when using the Dolby NR system, since it is most effective when recording and playback levels are the same.

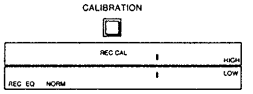
Making an Optimum Recording According to the Tape Type



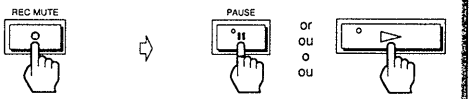
1 Insert the cassette to be used for recording.



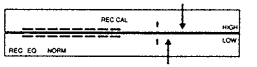
2 Press CALIBRATION.



3 Activate the recording test tones:



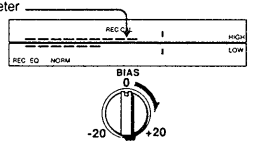
Playback level for an 8-kHz signal



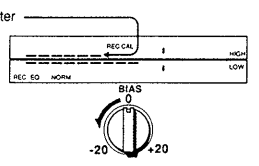
Playback level for a 400-Hz signal

4 Adjust BIAS until both meters indicate equal playback levels.

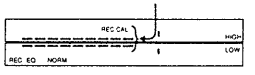
A high reading on the upper meter indicates a low bias current.



A low reading on the upper meter indicates a high bias current.



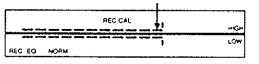
An equal reading on both meters indicates the optimum bias current condition.



5 Adjust REC LEVEL CALIBRATION until both meters reach the recommended level (REC CAL).

The bias current is now adjusted to the optimum level and the tape sensitivity compensation has been set. Press ■, then set CALIBRATION to OFF. Rewind the tape and start the actual recording.

Recommended level



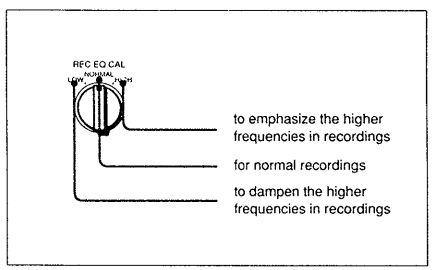
Note

- The sound cannot be monitored during the calibration operation.
- It takes 2 to 3 seconds to stabilize the test tone level.

Making an Optimum Recording According to the Tape Type

Recording Equalization Calibration

Although bias currrent and equalization are automatically set by the Automatic Tape Selection (ATS) function for the tape being used, you can use the REC EQ CAL switch to change the recording characteristics according to the nature of the source material or to compensate for the particular characteristics of the tape.


REC EQ CAL
NORMAL
to emphasize the higher frequencies in recordings
for normal recordings
to dampen the higher frequencies in recordings

Bias Calibration Recording
To modify bands of sound as required, use the REC EQ CAL switch in conjunction with bias calibration, which enables you to record according to the tape's characteristics.

- **When recording music which has strong middle and low frequencies**
  Set the bias at flat with the REC EQ CAL switch set in the HIGH position to increase the bias current.
  Adjust BIAS so that the HIGH and LOW meters indicate equal readings.
- **When recording music which has strong high frequencies**
  Set the bias at flat with the REC EQ CAL switch set in the LOW position to decrease the bias current.
  Adjust BIAS so that the HIGH and LOW meters indicate equal readings.

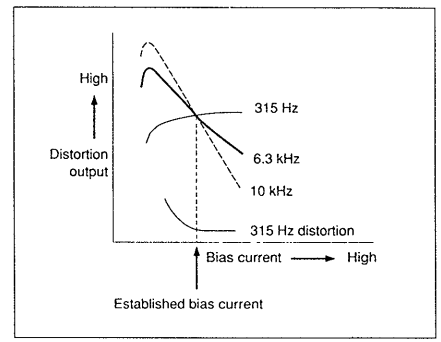
Note
With metal tape, because the amount of frequency characteristic modulation is not in proportion to that of the bias, the optimum bias current may not be obtained using the methods above.

Another use of the REC EQ CAL switch
When using a special tape, the BIAS control with the REC EQ CAL switch set in the NORMAL position may not cause the HIGH and LOW meters to indicate equal readings. If this occurs, adjust the BIAS control after setting the REC EQ CAL switch to HIGH or LOW.

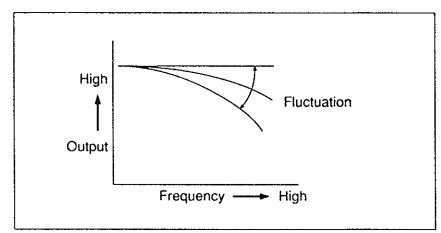
Recording

What is the Dolby HX PRO System?

The Dolby HX PRO system provides improved linearity in high-range frequency response during recording. Tapes recorded with this system retain the same high quality even when played back on other tape decks.



As shown above, characteristics such as output level and distortion differ widely according to the bias (high-frequency) current. In conventional systems, the bias current is susceptible to variations in certain recording signals (see diagram below) which may cause fluctuations in frequency response, distortion, or other unwanted characteristics.

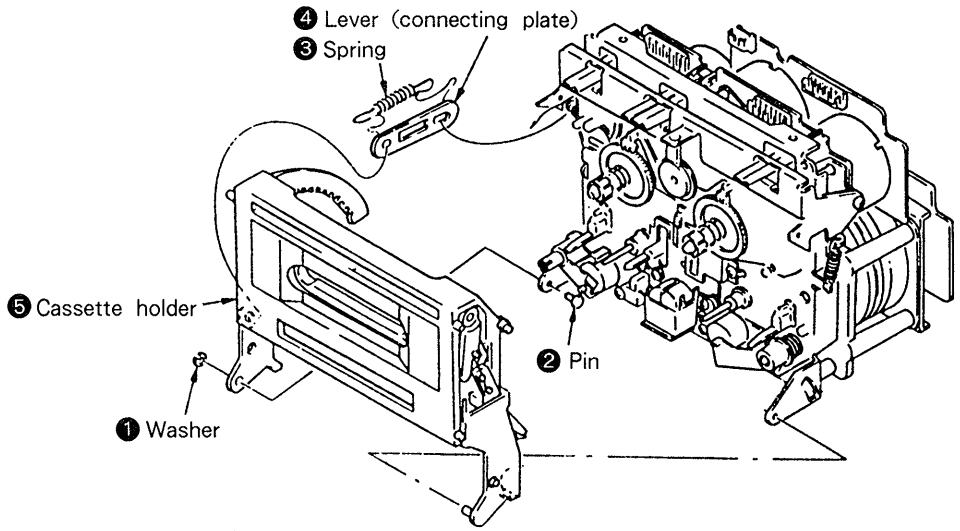


With the Dolby HX PRO system, the effective bias amount added to the bias current is controlled in millisecond units to greatly reduce distortion, improving linearity in high-range response and ensuring high-intensity recording with minimal distortion and noise.

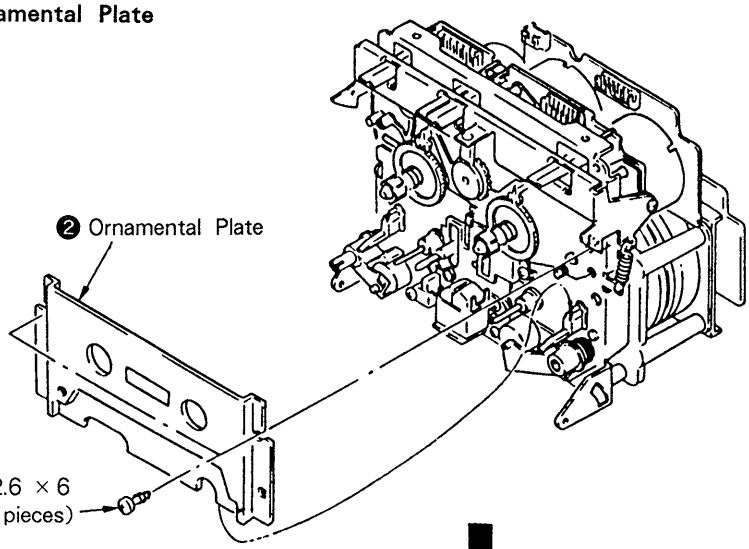
SECTION 2
DISASSEMBLY

• If the parts are marked with the numbers ❶, etc., remove them in the order of the number.

Cassette Holder

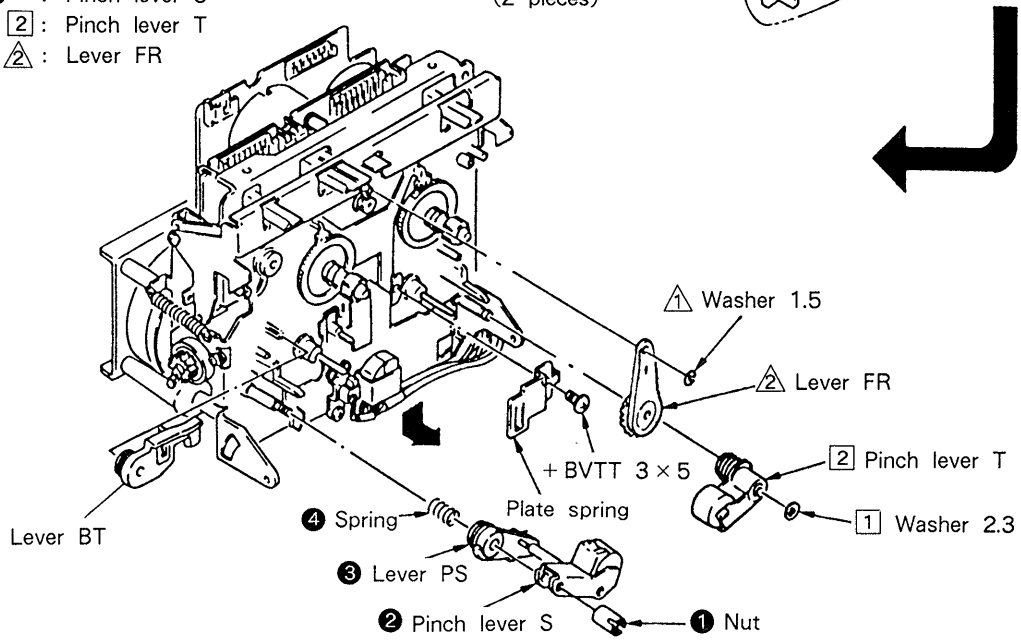


Ornamental Plate



Pinch Lever/Lever FR

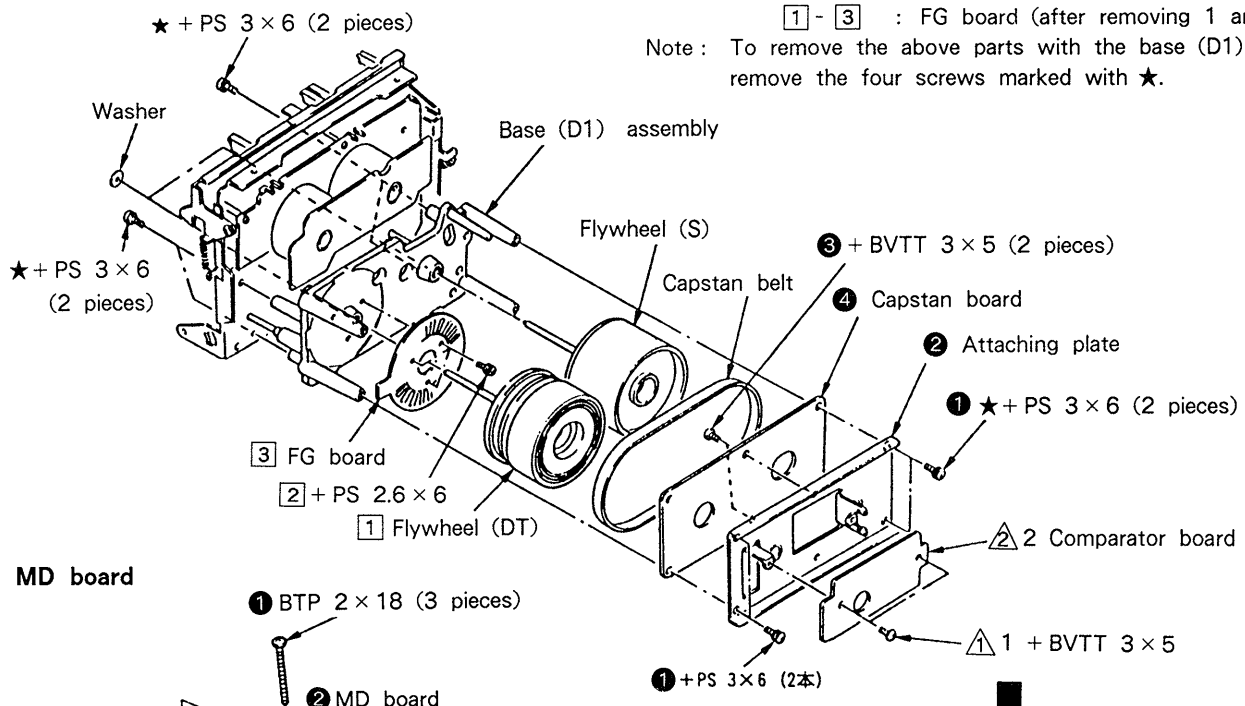
❶- ❹ : Pinch lever S
[1] and [2] : Pinch lever T
△1 and △2 : Lever FR



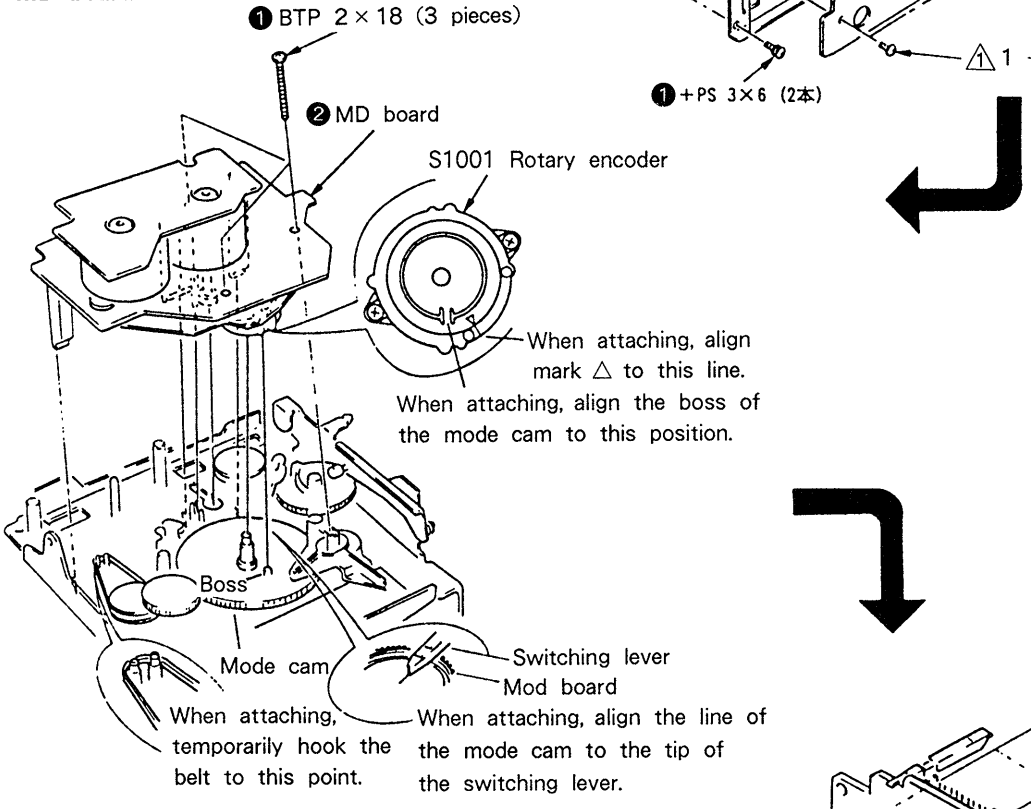
Comparator Board/Capstan Board/Flywheel/FG Board

△1 and △2 : Comparator board
❶ - ❹ : Capstan board
[1] - [3] : FG board (after removing 1 and 2)

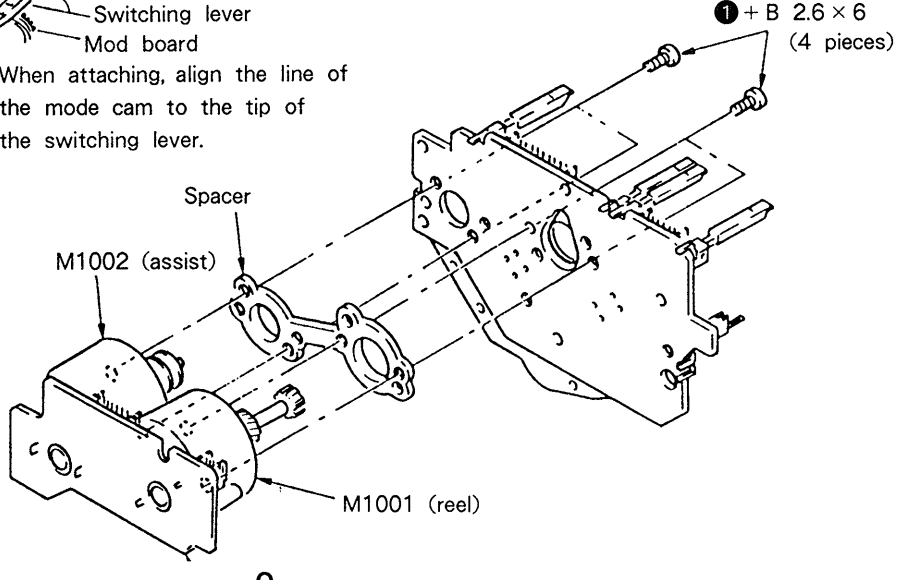
Note : To remove the above parts with the base (D1) assembly, remove the four screws marked with ★.


★ + PS 3 × 6 (2 pieces)
Washer
Base (D1) assembly
★ + PS 3 × 6 (2 pieces)
Flywheel (S)
❸ + BVTT 3 × 5 (2 pieces)
Capstan belt
❹ Capstan board
❷ Attaching plate
❶ ★ + PS 3 × 6 (2 pieces)
[3] FG board
[2] + PS 2.6 × 6
[1] Flywheel (DT)
△2 2 Comparator board
△1 1 + BVTT 3 × 5
❶ + PS 3 × 6 (2本)

MD board


❶ BTP 2 × 18 (3 pieces)
❷ MD board
S1001 Rotary encoder
When attaching, align mark △ to this line.
When attaching, align the boss of the mode cam to this position.
Boss
Mode cam
Switching lever
Mod board
When attaching, temporarily hook the belt to this point.
When attaching, align the line of the mode cam to the tip of the switching lever.

Reel Motor Board



SECTION 3
ADJUSTMENTS

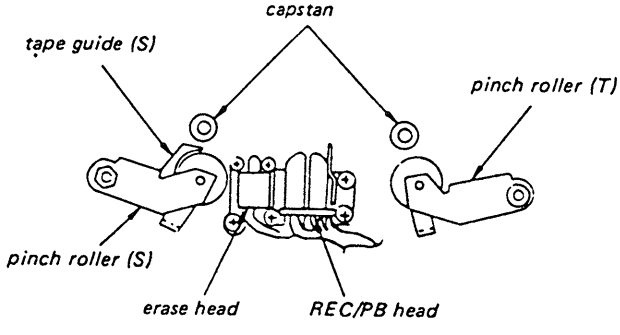
3-1. MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab:

record/playback head	pinch roller
erase head	rubber belts
capstan	idlers

2. Demagnetize the record/playback and erase head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.



Tape Path Adjustment

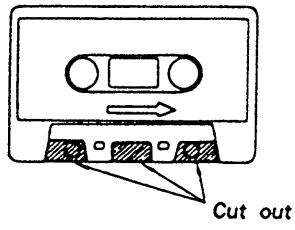
• Refer to Adjustment Position on page 12.

Note : When using the adjustment methods for other than replacement reasons, please do not tamper unnecessarily with the adjustment screws or the erasehead because either the supply pinch roller guide or the record/playback head will be made the standard tape paths. Moreover, when it is necessary to adjust and replace two or more of any of the heads and/or pinch rollers, replace them one by one, completely taking out the first tape path, and then replacing the second one.

Preparation :

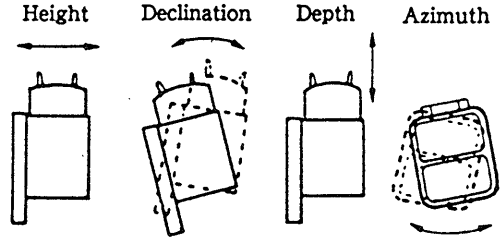
1. Mirror cassette CQ009C 8-909-708-01
   (or CQ012C 8-909-708-02)

   If one does not have this, cut out the sections of a 120-minute cassette shell as indicated below and use that cassette.



2. Phillips screwdriver (medium-size) :
   For the head adjustment screws
   Blade-type screwdriver (large-size) :
   For the supply pinch roller adjustment screws
3. Pen light
4. WS-48B (3 kHz, 0 dB)
5. P-4-A100 (10 kHz, -10 dB)

Definition of Terms : The figures are of a record/playback head.



Adjustment Method :

Supply Pinch Roller

Note : Only perform this adjustment when the supply pinch roller is to be replaced.

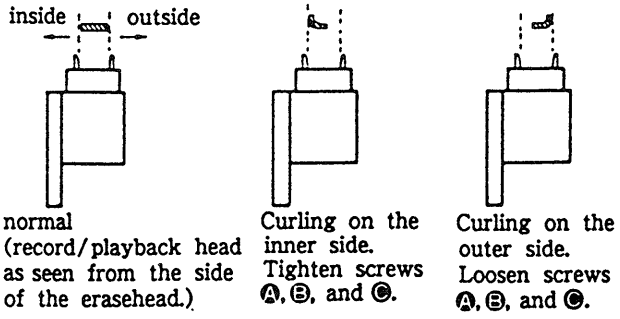
1. Insert the mirror cassette and put the unit in record/playback mode.
2. Check to see whether the tape is curling at the record/playback head guide or the pinch roller guide.
   If it is curling, remove the curl by adjusting the ⓓ tape curl adjustment screw. Then, check that the tape is running past the middle of the erasehead.

Record/playback Head

Note : Only perfom this adjustment when the record/playback head is to be replaced.

1. Insert the mirror cassette and put the unit in record/playback mode.
2. (**Height Adjustment**) Check to see if the tape is curling at the tape guide of the head. If it is curling, tighten screws Ⓐ, Ⓑ, and Ⓒ, respectively by the same angle, moving the head so that it

remains at the same angle throughout the procedure. If it curls on the bottom side of the mirror cassette (actually the inner side), tighten all the screws equally ; but loosen them if the tape begins to curl on the top side (outer side).



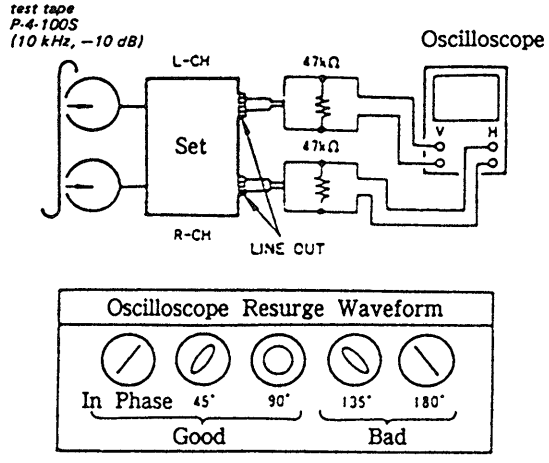
normal (record/playback head as seen from the side of the erasehead.)

Curling on the inner side. Tighten screws Ⓐ, Ⓑ, and Ⓒ.

Curling on the outer side. Loosen screws Ⓐ, Ⓑ, and Ⓒ.

3. (**Declination Adjustment**) While in the record/playback position, set the back tension to 0 (wind the supply reel with something thin like a pencil in a counterclockwise direction) and make sure there is no curling or shifting (shifting up/shifting down) at the guide of the record/playback head.

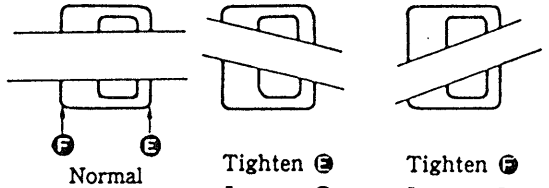
   Because shifting can only occur due to a difference in the width of the tape and that of the tape guides (curling will otherwise occur), it is necessary to pay close attention since it can be easily overlooked.
   When there is a shift, tighten screws Ⓑ and Ⓒ equally and change the declination of the head. If the tape is shifting up, tighten the screws, and if it is shifting down, loosen them.
4. Repeat the adjustments in steps 2 and 3 and fine adjust the height and the declination.
5. (**Preliminary Azimuth Adjustment**)
   After demagnetizing and cleaning the adjustment head, play back WS-48B (3 kHz, 0 dB).
   Turn screw Ⓒ so that the reading on the level meter of the unit or that of the level meter connected to LINE OUT is maximized.
   If the screw is turned at least half a revolution, repeat the adjustments from step 1.
6. (**Tape Path Check**) Connect the oscilloscope to LINE OUT and play back P-4-A100 (10 kHz, -10 dB) to display a resurge waveform. After 20 seconds of record/playback (after the tension within the loop has been increased sufficiently), make sure the variation in the resurge is within ± 90 degrees (within ± 45 degrees is desired). If the variation is greater than this, it is because the declination and/or the height adjustment is not perfect. Repeat the adjustments from step 1.



Erasehead

Note : Only perform this adjustment when the erasehead is to be replaced.

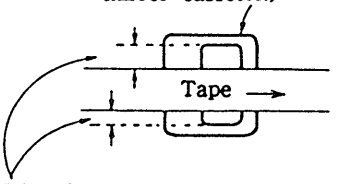
1. Insert the mirror cassette and put the unit in record/playback mode.
2. (**Azimuth Adjustment**) Adjust the azimuth of the erasehead by adjusting screws Ⓔ and Ⓕ so that the tape runs as evenly as possible.



(The erasehead as seen when erasing the mirror cassette.)

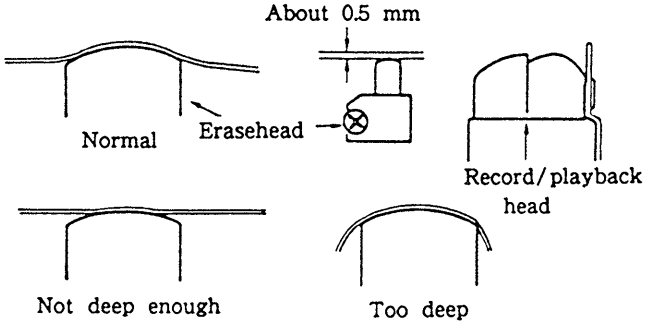
3. (**Height adjustment**) Turn screws Ⓓ, Ⓔ, and Ⓕ all by the same angle so that the portions of the erasehead visible at top and bottom are nearly of equal width. If the width at the top is greater, tighten the screws ; if the width at the bottom is greater, loosen the screws.

Erasehead (The erasehead as seen through the mirror cassette.)



Make these the same width.

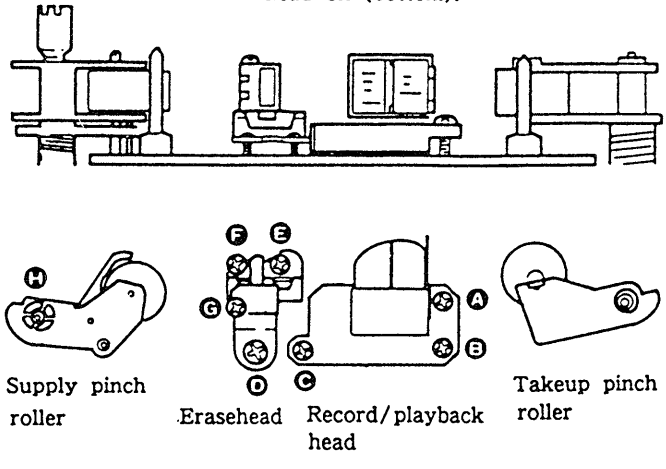
4. (**Declination Adjustment**) Leaving it in the playback position, put the back tension to 0 and make certain the erasehead part and supply pinch roller guide part do not shift. If there is a shift, turn the screw Ⓓ and change the declination. Looking at it using the mirror cassette, if the tape shifts up, tighten the screw, and if it shifts down, loosen the screw.
5. Repeat the adjustments beginning with step 2 and fine adjust the height and declination. And make sure the tape does not curl up on the pinch roller guide or the guide part of the record/playback head.
6. (**Depth Adjustment**) In order to make the entire head play the tape smoothly, and to make sure the depth of the erasehead is neither too shallow nor too deep, loosen screw Ⓒ a bit.



Check

1. Check to make sure that there are no curls or shifts throughout the whole tape path and that the tape runs smoothly.
2. Reapply the locking compound to the adjusted screws. (The locking compound should only be applied to screw Ⓒ after the azimuth has been adjusted.)

Adjustment Position : As seen from the cassette, side (top) and MD as seen head on (bottom).



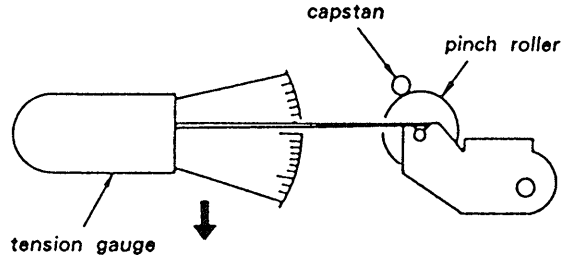
Pinch Roller Pressing Force Measurement

Mode : playback

Hook needle of the tension gauge to the pinch roller shaft and push back pinch roller to detach it from capstan. Then, return it gradually to capstan and read the gauge when the pinch roller begins turnning.

Standard Limits :

Tape-up side : 270 – 350g (9.5 – 12oz)
Supply side : 180 – 280g (6.4 – 9.9oz)



3-2. ELECTRICAL ADJUSTMENTS

Note: The adjustment should be performed in the order given in this service manual.
The adjustments should be performed for both L-CH and R-CH.

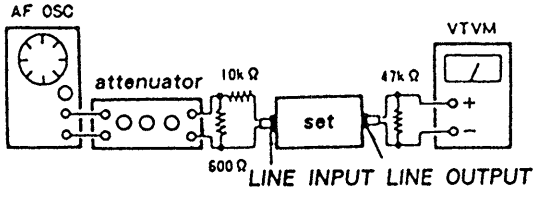
- Simultaneous REC/PB Mode:
  Input the signals to LINE IN terminal and set to REC mode. Set the monitor switch to TAPE, and monitor the recorded signal from LINE OUT terminal.
- Switch Position:
  DOLBY NR ..... OFF
  TIMER ..... OFF
  MONITOR ..... TAPE
  HX PRO ..... OFF
  CALIBRATION ..... OFF
  CD DIRECT ..... OFF
  BIAS ..... CENTER CLICK
  REC LEVEL ..... CENTER CLICK
- Standard Record:
  Deliver the standard input signal level to the input jack and set the REC LEVEL control to obtain the standard output signal level.

  Standard Input Level

Input Terminal	LINE IN
source impedance	10 kΩ
input level	0.25 V (–10 dB)

Standard Output Level

Output Terminal	LINE OUT
load impedance	47 kΩ
output level	0.44 V (−5 dB)



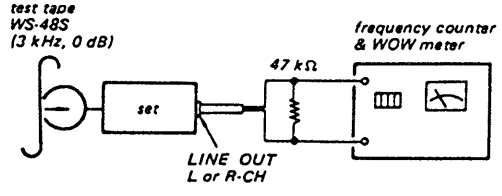
Torque Adjustment and Measurement

1. Insert a tape for torque measurement, CQ-102C, and put the set to PLAY mode. Adjust RV801 so that the reading of the torque meter is 40 ± 5g.cm.
2. After the adjustment, measure the back-tension and the FF/REW torque and check that the following specifications are satisfied.

Torque	Torque Meter	Reading
FWD	CQ-102C	35 − 45g • cm (0.49 − 0.64oz • inch)
FWD Back tension	CQ-102C	7 − 12g • cm (oz • inch)
FF/REW	CQ-201B	55 − 120g•cm (0.97 − 1.67oz•inch)

Tape Speed/WOW Check

Procedure:



1. Measure the output frequency and the WOW value while playing back the tape top of the test tape.
2. Turn over the test tape, measure the output frequency and the WOW value, and check the difference from the values of the step 1.

Adjustment Limits :

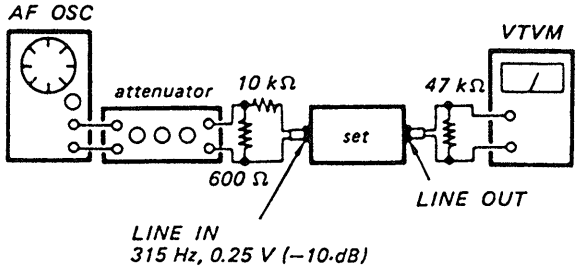
TAPE SPEED deviation: within 2,990 to 3,010 Hz
TAPE SPEED fluctuating width: within 2,990 to 3,010 Hz
WOW (WRMS): 0.037 % or less

MPX FILTER Check

Setting : DOLBY switch : OFF
MPX FILTER switch : OFF

Procedure :

1. Mode: stop



2. Apply 315Hz, 0.25V (− 10dB) signal and adjust REC LEVEL (RV501) control so that the LINE OUT level is 0.44V (− 5dB).
3. Apply 19kHz 0.25V (-10dB) signal and confirm that the LINE OUT level is 0.013V (-35dB) or less.

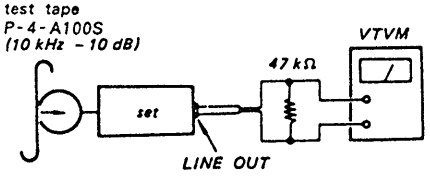
Adjustment Limits :

DOLBY NR switch : B or C
MPX FILTER switch : Line output level when ON.
315Hz : Within 0.49 to 0.39V (within − 4dB to − 6dB)
19kHz : 0.013V (− 35dB) or less

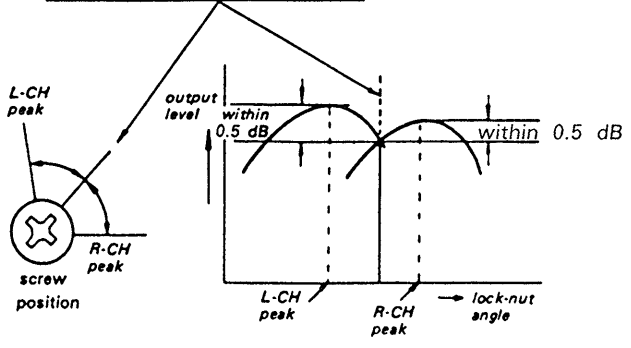
Record/Playback Head Azimuth Adjustment

Procedure :

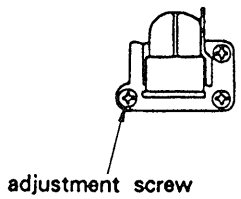
1. Mode : playback



2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 0.5dB.



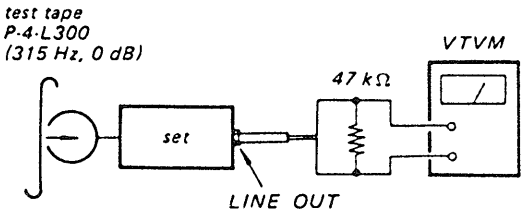
Adjustment Location :



Playback Level Adjustment

Procedure:

Mode: playback



Adjust RV101 (L-CH) and RV201 (R-CH) to obtain the specified LINE OUT level.

Adjustment Limits :

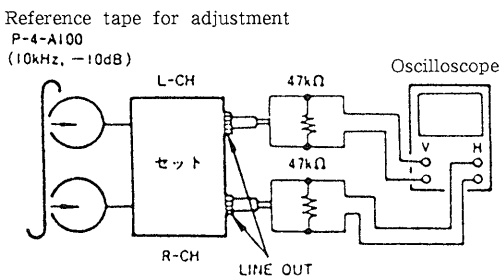
LINE OUT level : 0.42 to 0.46 V
(−5.3 to −4.7 dB)

Level difference between channels:
less than 0.5 dB

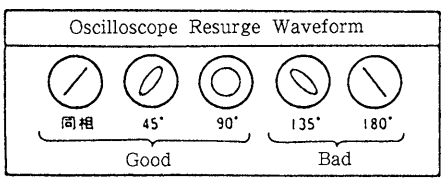
Check that the LINE OUT level does not change in playback mode while changing the mode from playback to stop several times.

3. Phase check

– Play mode –



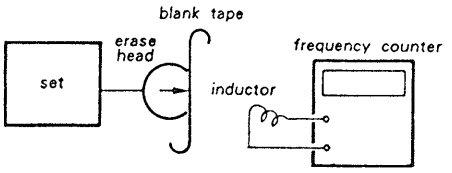
4. Check that the phase difference between L-ch and R-ch is within 0 ~ (same to 90°).



Bias OSC Frequency Adjustment

Procedure :

1. Record mode



1. Connect the frequency counter to the inductor which functions at 10 mH. (When the inductor is a closed magnetic circuit, redesign the inductor to be anopenmagnetic circuit.
2. Remove the cassette lid, insert the cassette, and put the unit into REC mode.
3. Move the inductor from the side in close to the erase head to check the value of the bias.
4. Adjust CP501 so that the reading on the frequency counter is 105kHz ± 1kHz.

Bias current adjustment

1. Set the HX PRO switch to ON and insert the METAL tape.
2. Set RV104, RV204, RV105, RV205, RV106, and RV206 to be in the center position.
3. Connect a digital voltmeter to CNE504 (between 2-1 and 2-3) and adjust the adjustment cores of T101 and T201 so that the voltage is minimized.

CrO_2 Bias and Record Level Adjustment

Note : This adjustment should be made before Record Bias Adjustment.

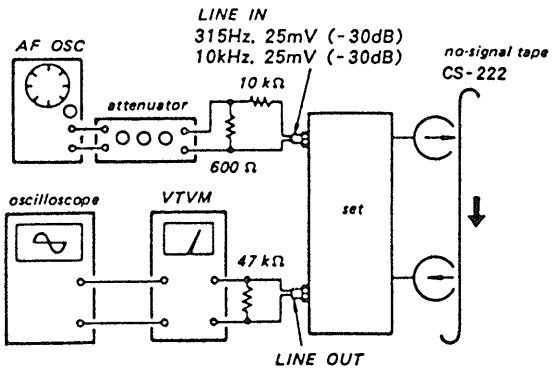
Setting:

REC LEVEL knob: standard record position
(See page 12.)

HX PRO switch : ON

Procedure:

1. Mode: simultaneous REC/PB



2. Adjust RV106 (L-CH) and RV206 (R-CH) so that the playback output level of 10kHz signal is 0.3dB −0.3dB with respect to that of 315Hz. • • • Record Bias Adjustment.
3. Adjust RV102 (L-CH) and RV202 (R-CH) so that the playback output level of 315Hz is -25.3dB to -24.7dB. • • • Record Level Adjustment.

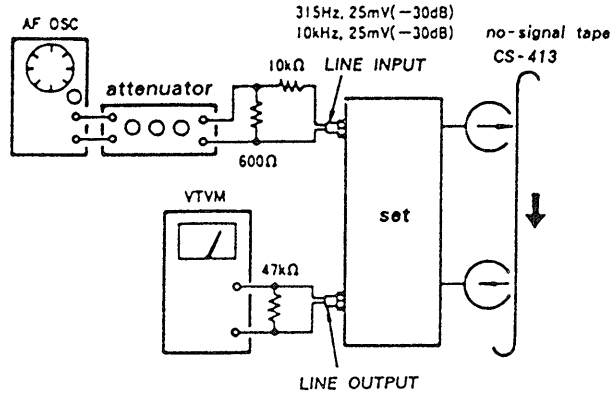
Metal Bias Adjustment

Setting :

REC LEVEL Knob : standard record position
(See page 12.)

Procedure :

1. Mode : simultaneous REC/PB



2. Adjust RV510 (L-CH) and RV205 (R-CH) so that the difference between the playback output at 315Hz and that of 10kHz in R-CH is within 0.5 dB to −0.5dB.

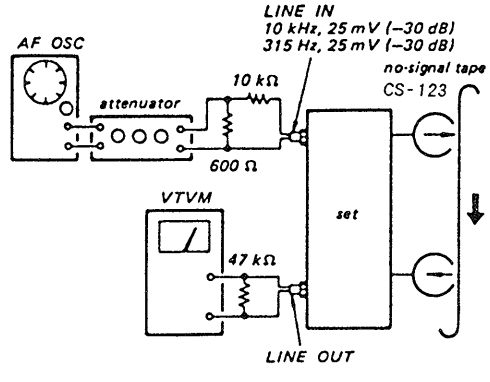
Normal Bias Adjustment

Setting:

REC LEVEL knob: standard record position
(See page 12.)

Procedure:

1. Mode: simultaneous REC/PB



2. Set the HXPRO switch to ON.
3. Adjust RV103 (L-CH) and RV203 (R-CH) so that the difference between the playback output at 315Hz and that of 10kHz in R-CH is within 0.5dB to −0.5dB.
4. Set the HXPRO switch to OFF.
5. Adjust RV104 (L-CH) and RV204 (R-CH) so that the difference between the playback output at 10kHz when the HXPRO is ON and that of 10kHz when ON is within 0.5dB to −0.5dB.

Meter Level Adjustment

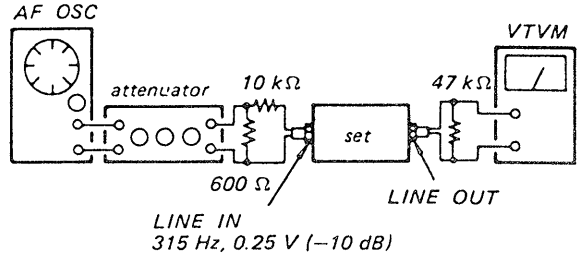
Setting :

REC LEVEL Knob : standard record position
(See page 12.)

MONITOR : SOURCE

Procedure :

1. Stop mode



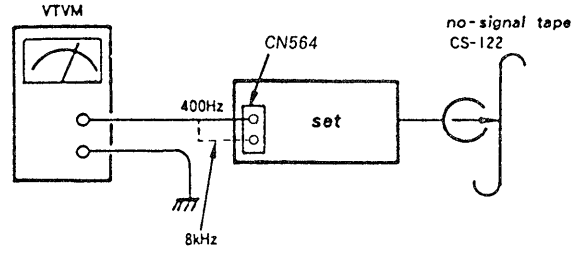
2. Adjust RV107 (L-CH) and RV207 (R-CH) so that a reading of the meter is set to 0VU and the lamp is lit.
3. Adjust REC level so that the LINE OUT level is set to +10dB and check that all the lamps are lit.

Calibration OSC and Calibration Meter Adjustment

Setting : CALBRATION switch : ON

Procedure (OSC OUT LEVEL) :

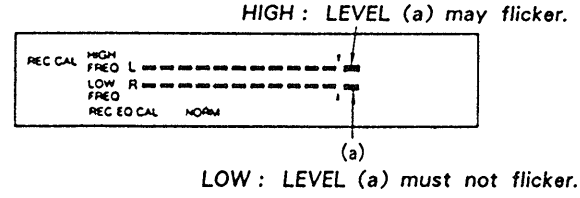
1. Mode : record (no-signal (LINE INPUT))



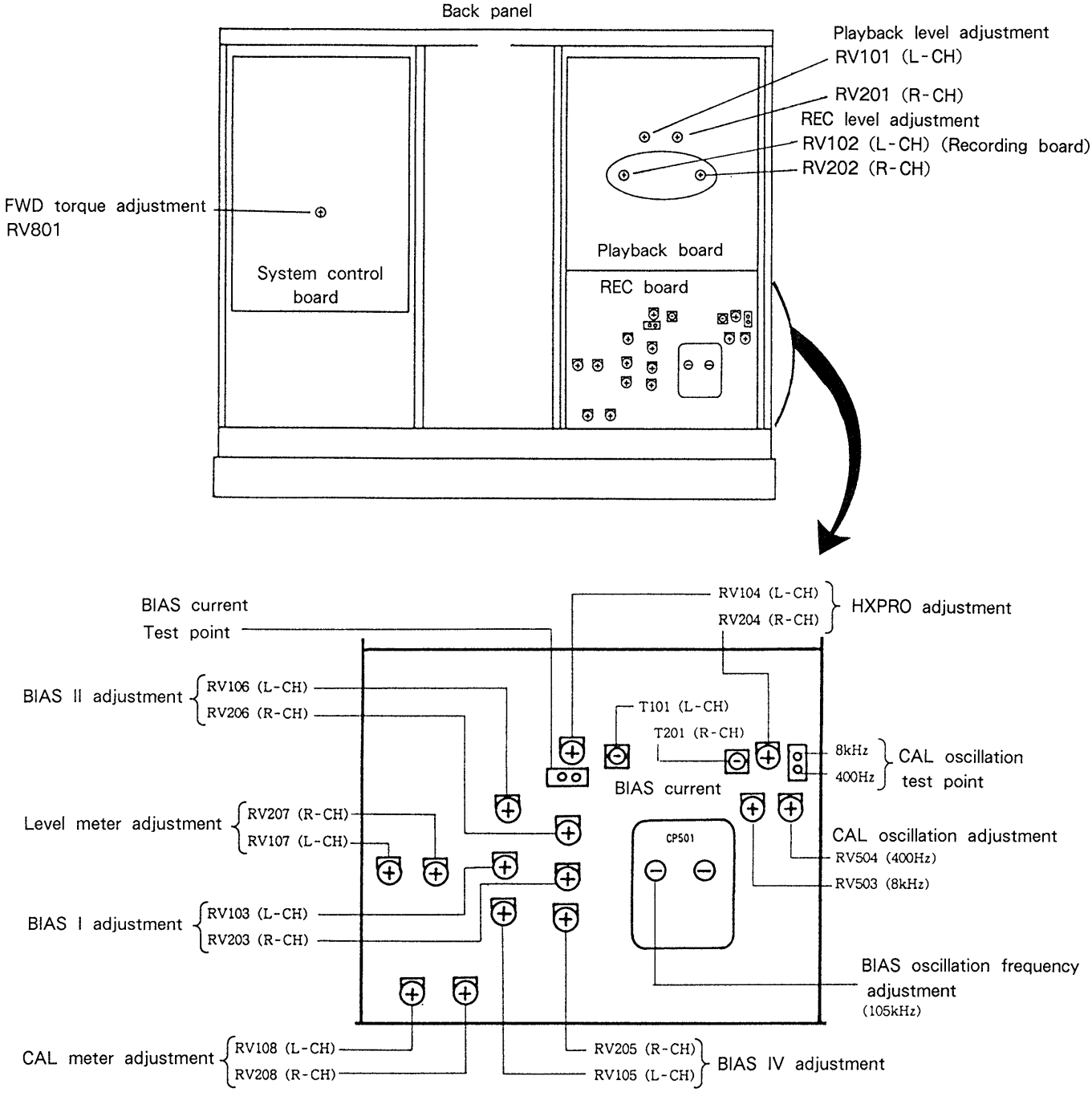
2. Adjust RV504 so that a check-point level at 400Hz is + 10dB.
3. Adjust RV503 so that a check-point level at 8kHz is + 10dB.

Procedure (CAL METER ADJ) :

1. Put the set in record mode and adjust RV208 (HIGH) so that HIGH FREQ segments in the CAL LEVEL meter light thoroughly up to 0 VU as shown in the figure below. Segment (a) may flicker.
2. Preset RV108 (LOW) so that segment (a) in LOW FREQ CAL LEVEL meter lights. Then adjust RV204 to the point where segment (a) goes out.



Location Diagram of the Adjustment Parts



SECTION 4
DIAGRAMS

4-1-1. IC502, 505 (CX20188) PIN FUNCTIONS

An electronic switch circuit for the operation mode control is included. Controls are performed by adding direct current voltages VH, VM, and VL to Dolby OFF/B/C and calibration/REC/Playback terminals.

CX20188 Pin No.	Pin name	Description
1.	Vcc	Positive power supply terminal.
2, 41.	REC IN	Recording input terminal.
3.	I REF	Reference current input terminal.
4, 39.	PB IN	Playback input terminal.
5.	CAL/REC/PB	Calibration/recording/playback select terminal
6, 37.	PB FB	Playback feedback terminal.
7, 36.	REC FB	Recording feedback terminal.
8, 35.	GND	GND terminal.
9, 34.	LINE OUT	Line output (decode output) terminal.
10, 33.	SSK	Spectral skewing switch terminal.
11, 32.	VF IN	Encode circuit input terminal.
12, 31.	HPF H	HLS high-pass filter terminal.
13, 30.	TCH 2	HLS detector time constant terminal 2.
14, 29.	TCH 1	HLS detector time constant terminal 1.
15, 28.	WT H	HLS encoder error reduction terminal.
16, 27.	TCL 2	LLS detector time constant terminal 2.
17, 26.	TCL 1	LLS detector time constant terminal 1.
18, 25.	WT L	LLS encoder error reduction terminal.
19, 24.	HPF L	LLS high-pass filter terminal.
20, 23.	ANT S	Anti-saturation terminal.
21, 22.	REC OUT	Recording output (encode output) terminal.
38.	OFF/B/C	Dolby NR off/B type/C type select terminal.
40.	CAL IN	Calibration input terminal.
42.	Vee	Negative power supply terminal.

MODE	VOLT
VH	3 to 9.9V
VH	-0.7 to 0.7V
VL	-9.9 to -3

4-1-2. IC601 (M50940-313SP) PIN FUNCTIONS

Level meter display of 24-segment fluorescent display, etc., are performed by receiving direction from the master microcomputer (IC801).

Pin No.	Pin name	I/O	Description
1.	Vref	I	A/D input-port reference voltage input(+5V)
2.	ϕL	I	Not used. (Connected to +5V)
3.	ϕR	I	Not used. (Connected to +5V)
4.	DATA	I	Data input from the master microcomputer(IC801)(analog)
5. ~6.	ADE1~ADR0	I	Data input from the master microcomputer(IC801)(analog)
7.	KEY	I	Not used. (Connected to +5V)
8.	LEVEL L	I	Level meter L-CH input(analog) from the meter amplifier(IC514)
9.	LEVEL R	I	Level meter R-CH input(analog) from the meter amplifier(IC514)
10. ~13.	$\overline{\text{GRID6}}$~$\overline{\text{GRID3}}$	0	Not used.
14. ~15.	$\overline{\text{GRID2}}$~$\overline{\text{GRID1}}$	0	Fluorescent display grid output
16.	$\overline{\text{C00}}$	0	Not used.
17.	$\overline{\text{PLAY}}$	0	Not used. (Connected to pin ⑱.)
18.	$\overline{\text{PLAY}}$	0	Not used.
19.	$\overline{\text{PAUSE}}$	0	Not used.
20.	$\overline{\text{REC}}$	0	Not used.
21.	$\overline{\text{TAPE}}$	0	Fluorescent display segment output("TAPE" displayed). "L": TAPE displayed. "H": SOURCE displayed.
22.	$\overline{\text{OVER LEVEL}}$	0	Fluorescent display segment output("OVER LEVEL" displayed). It is displayed when "L".
23.	TYPE I	0	Fluorescent display segment output("TYPE I" displayed). It is displayed when "L".
24.	$\overline{\text{TYPE II}}$	0	Fluorescent display segment output("TYPE II" displayed). It is displayed when "L".
25.	$\overline{\text{TYPE IV}}$	0	Fluorescent display segment output("TYPE III" displayed). It is displayed when "L".
26.	CNVss	-	Power supply terminal(GND)
27.	$\overline{\text{RESET}}$	I	Reset input
28.	XIN	I	Clock input(4MHz)
29.	XOUT	0	Clock outupt.
30.	XCIN	-	Not used. (Connected to GND)
31.	XCOUT	-	Not used.
32.	Vss	-	Power supply terminal(GND)
33.	Φ	0	Not used.
34.	VER	I	Version switching input(Always set to "L")
35.	$\overline{\text{TEST}}$	I	Test mode input. "L": All the lamps of the meter are lit.
36.	CAL	I	Calibration switch(S602) input. "L": CAL mode. "H": Normal mode.
37.	IN	I	Not used. (Connected to GND.)
38.	VP	I	Fluorescent display segment output's pull-down power supply terminal(-22V)
39. ~62.	S23~S0	0	Fluorescent display segment output(meter display)
63.	AVcc	-	Power supply terminal(+5V)
64.	Vcc	-	Power supply terminal(+5V)

4-1-3. IC801 (M50964-220SP) PIN FUNCTIONS

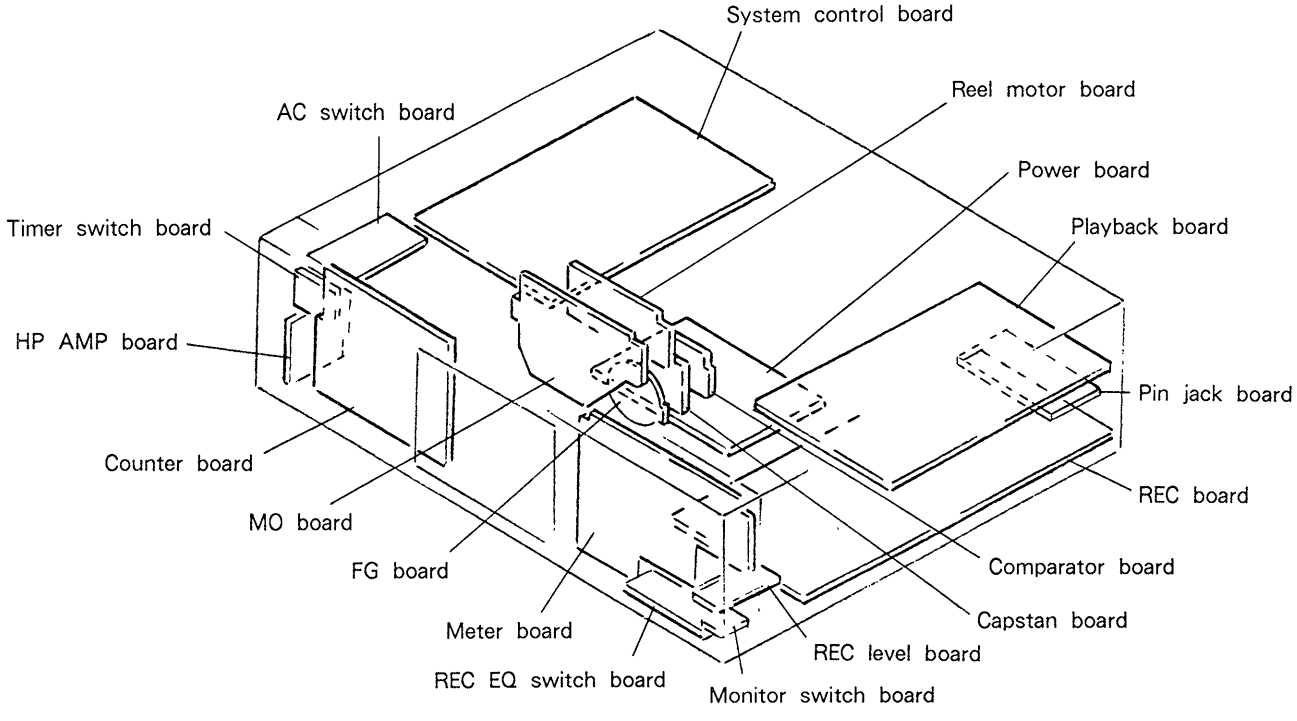
Pin No.	Pin name	I/O	Description
1.	VCC		Power supply: +5V.
2.	AVss		Analog GND.
3.	Vref	I	A/D port reference voltage input.
4.	DA		Not used for this model.
5.	PWM		Not used for this model.
6.	P.OFF		Not used for this model. Connected to GND.
7.	$\overline{\text{LED}}$	0	PAUSE LED output.
8.	$\overline{\text{LED}}$	0	REC LED output.
9.	$\overline{\text{LED}}$	0	PLAY LED output.
10.	AD1	I	Key input. 0V=⏏, 1V=■, 2V=◀◀, 3V=▶▶, 4V=●.
11.	AD2	I	Key input. 0V=▶, 1V=❚❚, 2V=⏮, 3V=⏭, 4V=○.
12.	AMS SIG	I	AMS signal input. No song detected = Low. Song detected = High.
13.	AD4	I	Key input. 2V = DISPLAY. 3V = MONITOR.
14.	CODE	I	Remote control category select switch.
15.	ALB		Connected to 5V.
16.	ϕR	I	Take-up reel base sensor input.
17.	ϕL	I	Supply reel base sensor input.
18.	C RESET		Model select input. Connected to GND.
19.	C MEMORY		Model select input. Connected to GND.
20.	COO		Not used for this model.
21.	POWER IN	I	Power on and off detection.
22.	SIRW	I	SIRCS phase input.
23.	$\overline{\text{SIRE}}$	I	SIRCS reverse phase input.
24.	$\overline{\text{T-REC}}$	I	Timer REC switch input.
25.	$\overline{\text{T-PLAY}}$	I	Timer PLAY switch input.
26.	$\overline{\text{INT}}$	I	External interruption input. Interruption process is performed when the power is on or off.
27.	Vss		GND.
28.	$\overline{\text{RESET}}$	I	Reset input.
29.	XIN	I	Clock input (4 MHz).
30.	XOUT	0	Clock output (4 MHz).
31.	ϕout		Not used for this model.
32.	Vss		GND.
33.	$\overline{\text{C1}}$	I	Rotary encoder input to detect the position of the head base of the mechanical block.
34.	$\overline{\text{C2}}$	I	Rotary encoder input to detect the position of the head base of the mechanical block.
35.	$\overline{\text{C3}}$	I	Rotary encoder input to detect the position of the head base of the mechanical block.
36.	$\overline{\text{C4}}$	I	Rotary encoder input to detect the position of the head base of the mechanical block.
37.	$\overline{\text{OPEN SW}}$	I	OPEN switch input of the mechanical block.
38.	$\overline{\text{CLOSE SW}}$	I	CLOSE switch input of the mechanical block.
39.	$\overline{\text{DOOR SW}}$	I	DOOR switch input of the mechanical block.
40.	$\overline{\text{REC SW}}$	I	REC switch input of the mechanical block.
41.	M PLAY	0	Reel motor rotates at PLAY speed.
42.	M FAST	0	Reel motor rotates at FF/REW speed.
43.	M FWD	0	Reel motor rotates.
44.	M REV	0	Reel motor rotates in reverse.
45.	CAM DOWN	0	Head base DOWN output of the mechanical block
46.	CAM UP	0	Head base UP output of the mechanical block
47.	C OFF	0	Counter light-off output
48.	M OFF	0	Meter light-off output
49.	BIAS	0	Bias oscillation on and off control
50.	$\overline{\text{R Mt}}$	0	REC MUTE.
51.	$\overline{\text{M Mt}}$		Not used for this model.
52.	$\overline{\text{T Mt}}$	0	Tape MUTE. Goes to low when the tape is being played.
53.	$\overline{\text{S Mt}}$	0	Source MUTE. Goes to low three seconds after the power is on.
54.	AMS	0	AMS switch output. Goes to low when AMS is being used.
55.	MONITOR		Not used for this model. Connected to GND.
56.	$\overline{\text{HALF}}$		Not used for this model. Connected to GND.
57.	DAT3	0	Outputs parallel data for the counter display.
58.	DAT2	0	Outputs parallel data for the counter display.
59.	DAT1	0	Outputs parallel data for the counter display.
60.	DAT0	0	Outputs parallel data for the counter display.
61.	DATD	0	Outputs parallel data for the counter display.
62.	CLK	0	Clock output to transmit the parallel data.
63.	LATCH	0	Output for latching the transmitted data.
64.	CAL IN	I	CAL switch input.

4-1-4. IC881 (HD404240A80S) PIN FUNCTIONS

Fluorescent dynamic display is performed by receiving count data from the master microcomputer (IC801)

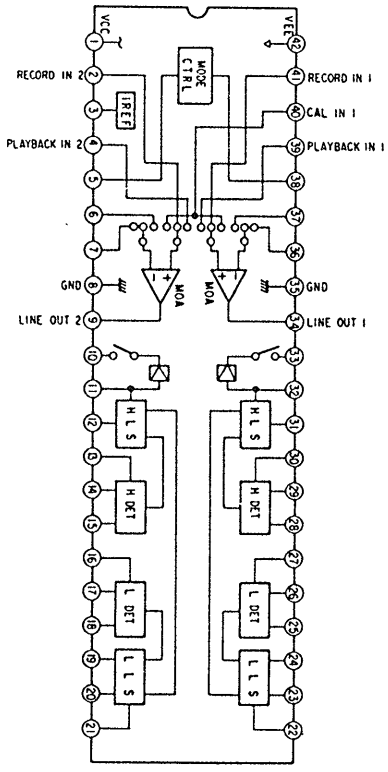
Pin No.	Pin name	I/O	Description
1.	SG3	O	Fluorescent display grid output
2.	G4	O	Fluorescent display grid output
3.	dot	O	Fluorescent display segment output
4.	P DWN	I	Pull-down power supply terminal for fluorescent display segment output (-22V)
5. ~11.	g~a	O	Fluorescent display segment output
12.	-	-	Not used.
13. ~16.	DIM1~DIM4	I	Dimmer input (Pins ⑭ and ⑯ are "H". Others are opened and fixed: Blanking time 550usec; grid ON time 450usec.)
17. ~20.	-	-	Not used.
21.	Vcc	-	Power supply terminal (+5V)
22.	SCK	I	Shift clock input (250kHz) from the master microcomputer (IC801)
23.	SI	I	Serial data input (Data are sent by 1 byte every 6msec.) from the master microcomputer (IC801)
24. ~25.	-	-	Not used.
26.	RESET	I	Reset input from the master microcomputer (IC801). Reset when "H".
27.	$\overline{\text{TEST}}$	I	Connected to +5V.
28.	OSC1	I	Clock input (4MHz)
29.	OSC2	I	Clock input (4MHz)
30.	GND	-	Power supply terminal (GND)
31. ~34.	-	-	Not used.
35.	MLED	O	Not used. (Connected to +5V)
36. ~40.	-	-	Not used.
41.	G2	O	Fluorescent display grid output
42.	G1	O	Fluorescent display grid output

4-2. CIRCUIT BOARDS LOCATION

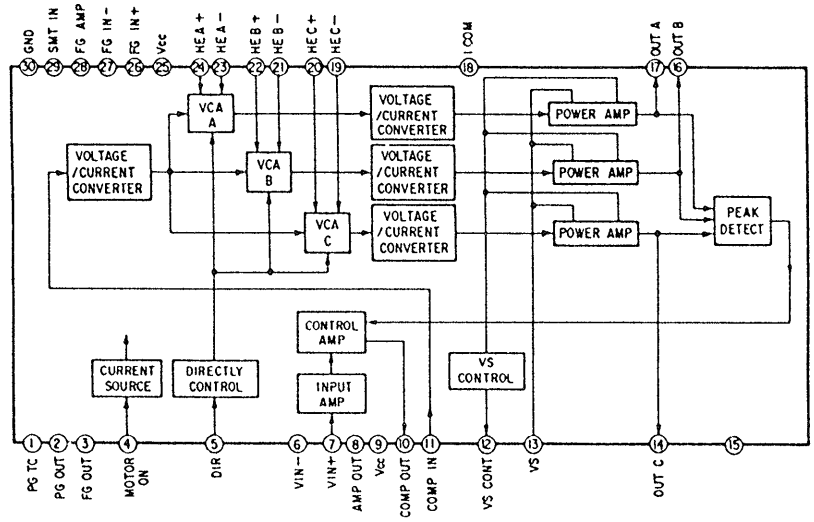


4-3. IC BLOCK DIAGRAMS

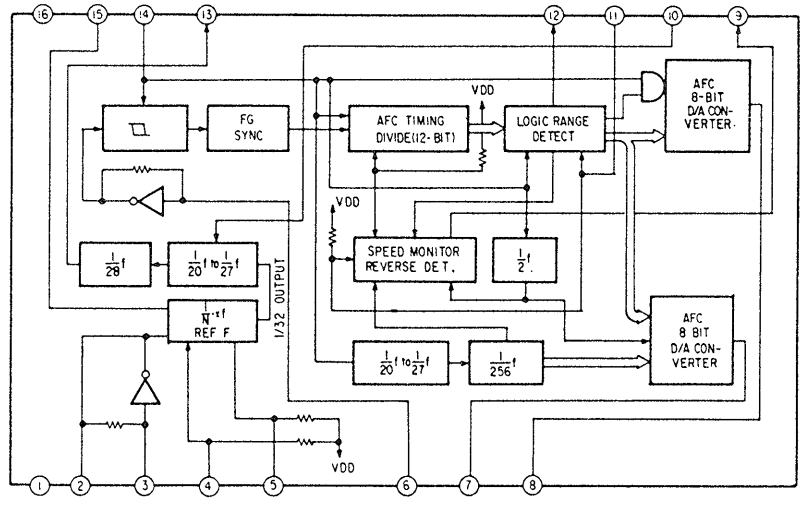
IC502, 505 CX20188



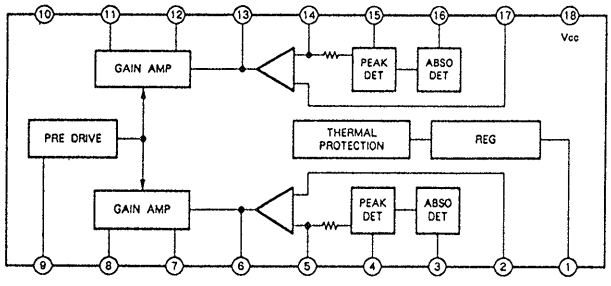
IC902 CX20174



IC952 TC-9142P

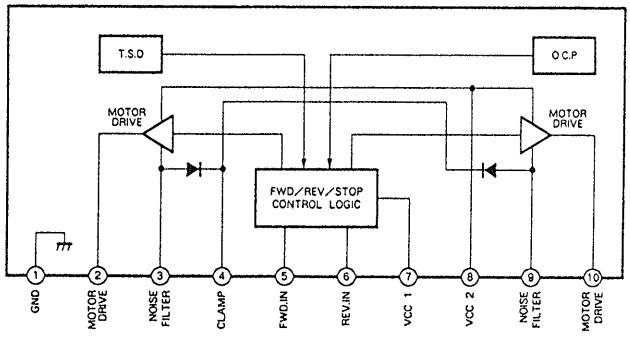


IC508 μPC1297CA



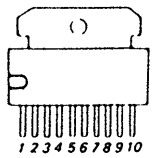
IC802 BA6219B

IC803 LB1641

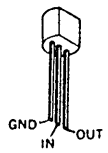


4-4. SEMICONDUCTOR LEAD LAYOUTS

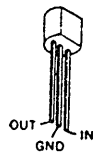
BA6219B



M5F7807
RC79L12A



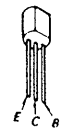
M5F7907
RC78L12A



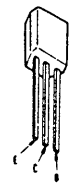
2SK246-GR2

2SK147

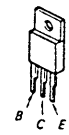
2SB716
2SC945-P
2SC1815-GR
2SD666A



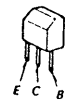
DTA114ES
DTA144ES
DTC114ES
DTC124ES
DTC143ES
DTC144ES
2SB1370-EF
2SC2603-EF
2SC2682-QPE
2SC3623A-LK
2SD2061-EF



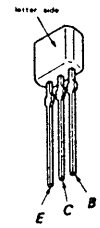
2SA985A
2SC2275A



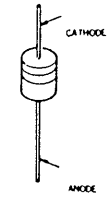
2SB734-34



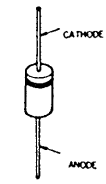
2SA1175-HFE
2SD1020-HFE



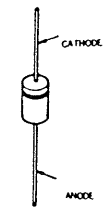
RD5.1JS-B1
HZS6C1L
HZS6C3L
UZL-6M2
UZL-24L
1SS202-1



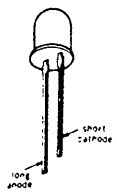
HZ6B2L
HZ12B2L
10E2N



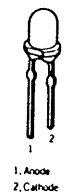
30DF2



SEL4414E-C
SEL4814A-CD



SEL4214S



4-5. BLOCK DIAGRAM

PB EQ AMP
HRP501 (1/2)
L-CH
(PB HEAD)
Q101
Q102
Q103-105
PB EQ AMP IC501
RV101 PB LEVEL
TAPE I, IV SWITCH Q106
TAPE II, IV SWITCH Q501, 502
HIGH PASS FILTER IC101
HIGH PASS FILTER IC102
PB DOLBY AMP IC502
PB IN
CAL IN
OFF B/C
LINE OUT
DOLBY
AMS AMP
IC503 (1/2)
IC503 (2/2)
AMS SWITCH Q507
AMS SIG
R-CH
AMS MUTE SWITCH Q505, 506
CAL SWITCH Q503, 504
CAL.AMS SWITCH Q508
IC509
IC510
RV502
RV501
RV506 PHONE LEVEL
HP AMP IC507 (1/2)
J502 LINE OUT
J503 PHONES
RY501
RY502
DOLBY OFF: L B: M C: H
RY503
Q540
S603 INPUT
LINE
CD
J501
CD DIRECT
LINE IN
RV501 REC LEVEL
MPX FILTER BUFFER IC504
MPX FILTER
REC DOLBY AMP IC505
RV502 REC LEVEL
LOW
NORMAL
HIGH
S501 REC EQ CAL
RV102 REC LEVEL
REC MUTE Q107
EQ Q108
REC MUTE Q517
REC AMP IC506
SWITCHING Q611
HRP501 (2/2)
(REC HEAD)
T101 BIAS STEPUP TRANS
HX PRO IC508
RV104 HX PRO
HX PRO SWITCH Q118
HX PRO SWITCH Q539
S601 HX PRO
OFF
ON
BIAS SEL
Q522
Q523
Q524
RV601 BIAS
RV103 NORMAL BIAS
RV105 METAL BIAS
RV106 CrO2 BIAS
NORMAL BIAS Q112
CrO2 BIAS Q113
METAL BIAS Q114
HE501
(ERASE HEAD)
CP501 ERASE BIAS OSC
REG Q518, 519
BIAS SWITCH Q533, 534
BIAS SWITCH Q520
REC EQ SELECT NORMAL Q109
REC EQ SELECT CrO2 Q110
REC EQ SELECT METAL Q111
PB EQ
400Hz CAL OSC
IC515 (1/2)
Q530 OSC SWITCH
RV504 CALIBRATION 400Hz
8kHz CAL OSC
IC515 (2/2)
Q529 OSC SWITCH
RV503 CALIBRATION 8kHz
CAL SWITCH Q536
CAL SWITCH Q117, 535
CAL METER AMP IC513
RV108 METER ADJUSTMENT HIGH FREQUENCY
CAL METER AMP IC514
LEVEL METER SWITCH Q116
LEVEL METER AMP IC512
RV107 LEVEL METER
IC511
AMS MODE
IC602
S604 DOLBY NR
SWITCHING Q610
LINE MUTE Q816
MONITOR OUT SWITCH Q815
AMS MODE SWITCH Q812
REC MUTE SWITCH Q813
NORMAL SELECT SWITCH Q811
CrO2 SELECT SWITCH Q810
METAL SELECT SWITCH Q809
BIAS SWITCH Q814
RESET Q803, 804
REC LED SWITCH Q806
PAUSE LED SWITCH Q807
PLAY LED SWITCH Q808
REMCON RECEIVER IC882
INVERTER Q805
COUNTER DISPLAY CONTROL IC881
FLT-881 COUNTER
SYSTEM CONTROL IC801
LINE MUTE
MONITOR
AMS SIG
AMS MODE
REC MUTE
TYPE I
TYPE II
TYPE IV
BIAS
RESET
REC
PAUSE
PLAY
SIRCS-L
SIRCS-E
CAL SW
POWER
S-CLOCK
RST OUT
M-PLAY
M-FAST
M-REV
M-FWD
X IN
X OUT
CAM DOWN
CAM UP
T-PULSE
S-PULSE
TIMER SW
AD5
AD6
AD7
TAPE SW
SOURCE SW
OPEN SW
CLOSE SW
DOOR SW
REC SW
70μ SW
HALF SW
METAL SW
PAT3 ~ PAT0
DATA
ADR0
ADR1
RV801 TORQUE ADJUST
REEL MODE CONTROL Q802
REEL MOTOR DRIVER IC802
M1001 REEL MOTOR
X801 4MHz
ASSIST MODE CONTROL SWITCH Q801
ASSIST MOTOR DRIVER IC803
M1002 ASSIST MOTOR
T.UP REEL SENSOR IC1002
S.REER SENSOR IC1001
0V: REC 1V: PLAY 2V: OFF
S894: TIMER
S881: RESET S882: MEMORY S883: DISPLAY MODE
S889: PLAY S890: PAUSE S891: REW AMS S892: FF AMS S893: REC MUTE
S884: OPEN/CLOSE S885: STOP S886: REW S887: FF S888: REC
0V: RESET, 1V: MEMORY, 2V: DISPLAY MODE
S605 MONITOR
TAPE
SOURCE
AUTO
S1004 (OPEN)
S1003 (CLOSE)
S1002 (DOOR)
S1005 (FWD/REC TAB)
S1008 (70μS)
S1006 (HALF)
S1007 (METAL)
S001 ROTARY ENCODER
12V REG Q751, 756 D751, 752
9V REG Q752, 757 Q758, D753
5V REG Q753, 759 D754
POWER OFF SWITCH Q701
-5V REG Q754, D755
-22V REG Q755, D756 D757, 758
T701 POWER TRANSFORMER
TC-K970ES AEP, GERMANY MODEL
S701 POWER
TC-K333ESL E MODEL
IC509 7V REG
Q509~512 Q537 10V REG
IC510 -7V REG
Q513~516 Q538 -10V REG
X951 4.934MHz
SERVO CONTROL IC952
FG AMP IC951
FG COIL
CAPSTAN CONTROL IC902
CAPSTAN MOTOR COIL
H901~903
DISPLAY CONTROL IC601
SWITCHING Q602
SWITCHING Q601
TAPE TYPE SELECTOR Q606
SOURCE SWITCH Q608, 609
OVER LEVEL SWITCH Q607
TYPE NORMAL SWITCH Q603
TYPE CrO2 SWITCH Q604
TYPE METAL SWITCH Q605
FLUORESCENT LIGHT INDICATOR TUBE FLT-601
FL
S602 CALBRATION
S601 HX PRO
S603 INPUT

4-6. PRINTED WIRING BOARDS – AUDIO SECTION –

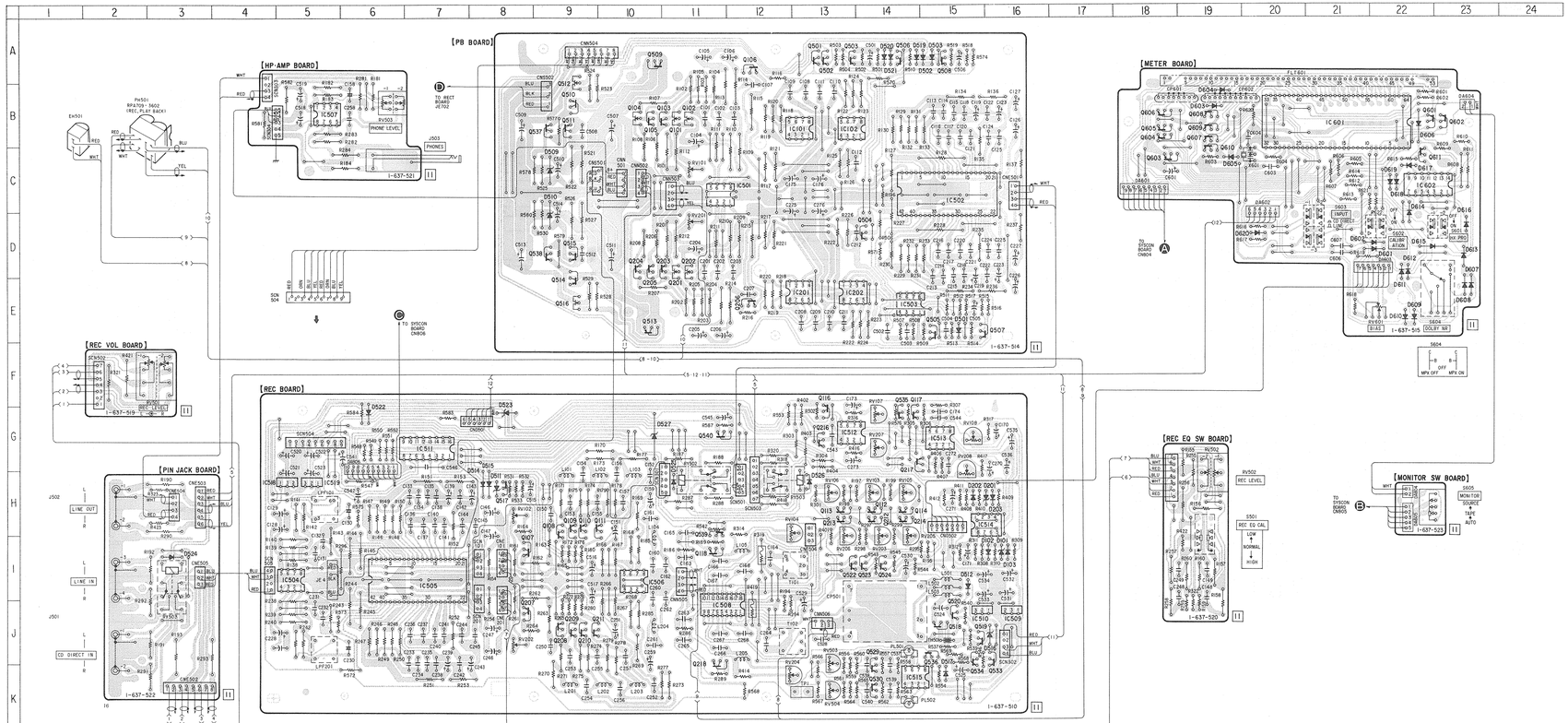
• Semiconductor Location

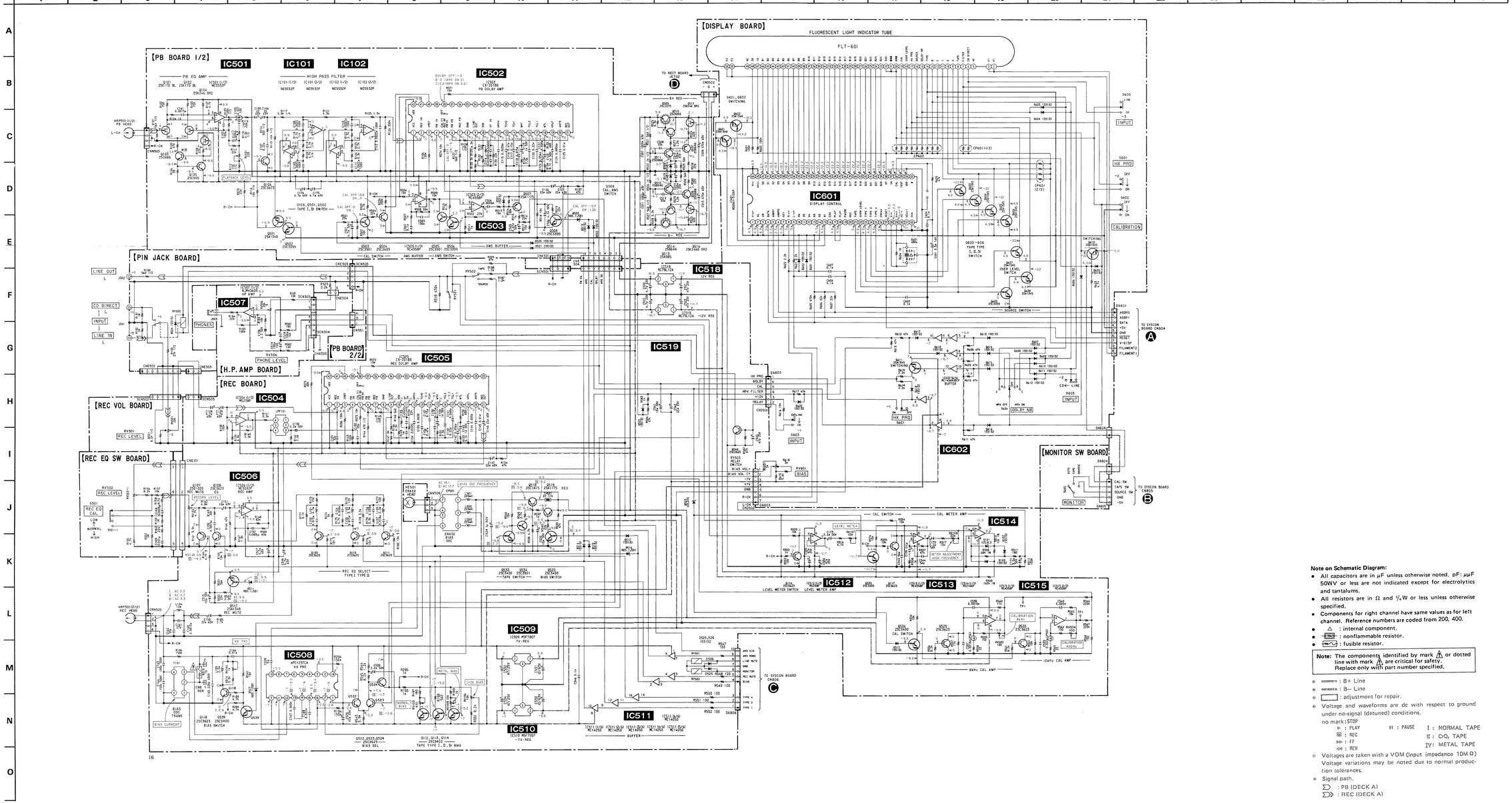
Ref. No.	Location	Ref. No.	Location
D101	I-16	Q105	B-10
D102	I-16	Q106	A-12
D103	I-16	Q107	I-8
D201	H-15	Q108	H-9
D202	H-15	Q109	H-9
D203	H-16	Q110	H-9
D501	E-15	Q111	H-9
D502	A-15	Q112	H-14
D503	A-15	Q113	H-13
D509	C-9	Q114	H-14
D510	C-9	Q116	G-13
D511	H-8	Q117	G-14
D512	I-15	Q118	I-11
D514	H-8	Q201	D-11
D515	H-8	Q202	D-11
D516	J-16	Q203	D-10
D517	K-15	Q204	D-10
D519	A-14	Q205	D-10
D520	A-14	Q206	E-12
D521	A-14	Q207	J-8
D522	G-6	Q208	J-9
D523	G-8	Q209	J-9
D524	I-3	Q210	J-9
D525	H-11	Q211	J-9
D526	H-13	Q212	H-14
D527	G-10	Q213	H-13
D601	D-22	Q214	H-14
D602	D-22	Q216	G-13
D603	B-19	Q217	G-14
D604	B-19	Q218	J-11
D605	C-19	Q501	A-13
D606	B-22	Q502	A-13
D607	E-23	Q503	A-13
D608	E-23	Q504	D-14
D609	E-22	Q505	E-15
D610	E-22	Q506	A-14
D611	D-22	Q507	E-15
D612	D-22	Q508	A-15
D613	D-23	Q509	A-10
D614	C-22	Q510	B-9
D615	D-22	Q511	B-9
D616	D-23	Q512	A-9
D617	C-22	Q513	E-10
D618	C-22	Q514	D-9
D619	C-22	Q515	D-9
D620	D-20	Q516	E-9
		Q517	H-8
IC101	B-13	Q518	J-15
IC102	B-13	Q519	J-15
IC201	E-13	Q520	I-15
IC202	E-13	Q522	I-13
IC501	C-11	Q523	I-14
IC502	C-15	Q524	I-14
IC503	E-14	Q529	J-14
IC504	I-5	Q530	K-14
IC505	I-7	Q533	J-16
IC506	I-10	Q534	J-15
IC507	B-5	Q535	G-14
IC508	J-11	Q536	J-15
IC509	J-16	Q537	B-9
IC510	J-15	Q538	D-9
IC511	G-7	Q539	H-11
IC512	G-13	Q540	G-11
IC513	G-15	Q601	B-22
IC514	H-15	Q602	B-23
IC515	K-14	Q603	B-18
IC518	H-5	Q604	B-18
IC519	H-5	Q605	B-18
IC601	B-21	Q606	B-18
IC602	C-22	Q607	B-19
		Q608	B-19
Q101	B-11	Q609	B-19
Q102	B-11	Q610	B-19
Q103	B-10	Q611	B-22
Q104	B-10		

Note on Mounting Diagram:

● ○——— : parts extracted from the component side.

● ■ : parts mounted on the conductor side.



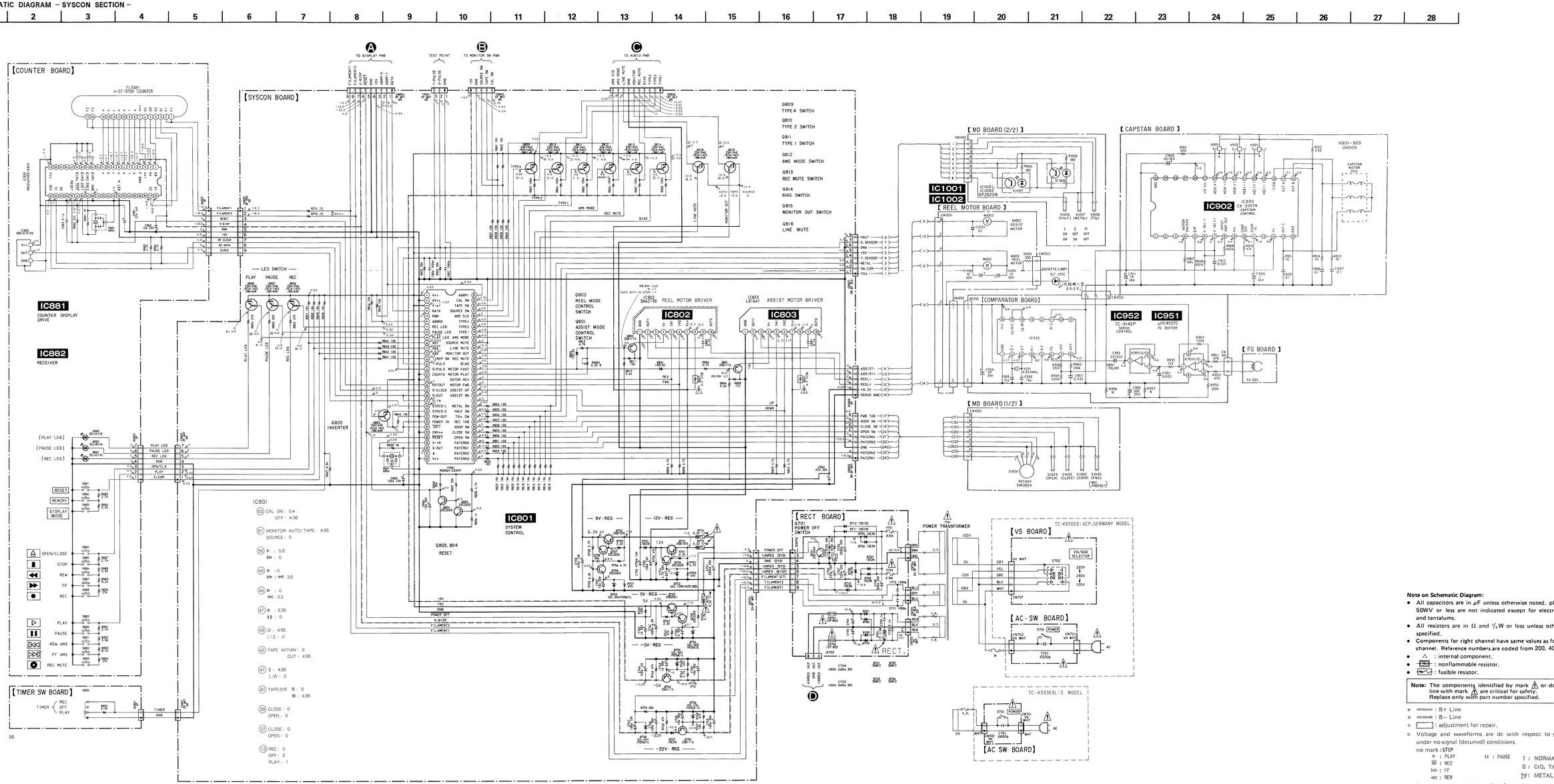


Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- Components for right channel have same values as for left channel. Reference numbers are coded from 200, 400.
- △ : internal component.
- : nonflammable resistor.
- : fusible resistor.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

- : B+ Line
- : B– Line
- : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : STOP
  ▷ : PLAY
  ▷▷ : FF
  ◁◁ : REW
  II : PAUSE
  I : NORMAL TAPE
  II : CrO_2 TAPE
  IV : METAL TAPE
- Voltages are taken with a VOM (Input impedance 10MΩ) Voltage variations may be noted due to normal production tolerances.
- Signal path.
  : PB (DECK A)
  : REC (DECK A)

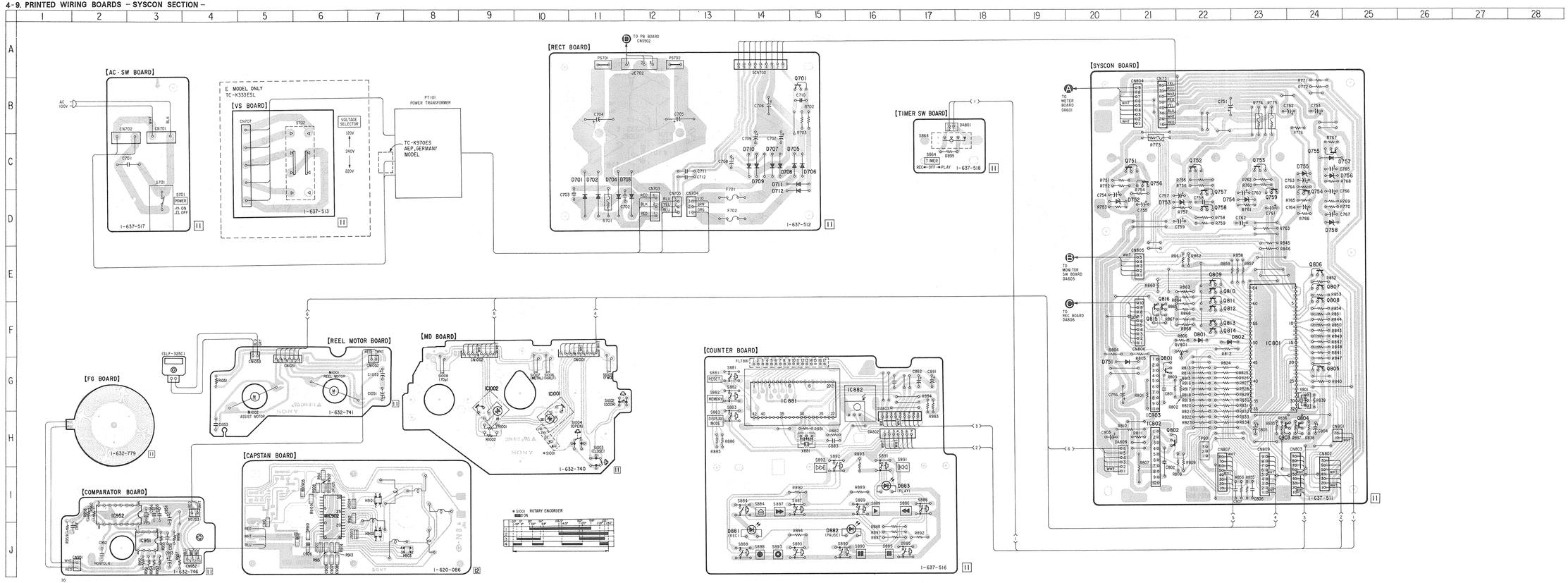


Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- Components for right channel have same values as for left channel. Reference numbers are coded from 200, 400.
- △ : internal component.
- ⚠ : nonflammable resistor.
- ⚠ : fusible resistor.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

- ⊖ : B+ Line
- ⊖ : B− Line
- ▭ : adjustment for repair.
- ⊖ Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : STOP
  ▷ : PLAY
  ▷▷ : FF
  ◁◁ : REW
  ▯▯ : PAUSE
  I : NORMAL TAPE
  II : CrO2 TAPE
  IV : METAL TAPE
- ⊖ Voltages are taken with a VOM (Input impedance 10MΩ) Voltage variations may be noted due to normal production tolerances.
- ⊖ Signal path.
  ⇒ : PB (DECK A)
  ⇒ : REC (DECK A)



• Semiconductor Location

Ref. No.	Location
D701	D-11
D702	D-11
D703	D-12
D704	D-11
D705	C-15
D706	C-15
D707	C-14
D708	C-14
D709	C-14
D710	C-14
D711	C-15
D712	D-15
D751	G-20
D752	D-20
D753	D-22
D754	D-23
D755	C-24
D756	C-24
D757	C-24
D758	D-24
D801	F-22
D802	F-22
D881	J-14
D882	J-15
D883	I-16
IC801	F-23
IC802	H-21
IC803	G-21
IC881	G-14
IC882	G-16
IC902	I-6
IC951	J-3
IC952	I-2
IC1001	G-10
IC1002	G-9
Q701	B-15
Q751	C-21
Q752	C-22
Q753	C-23
Q754	D-24
Q755	C-24
Q756	C-21
Q757	D-22
Q758	D-22
Q759	D-23
Q801	G-21
Q802	H-21
Q803	H-23
Q804	H-24
Q805	E-24
Q806	E-24
Q807	E-24
Q808	E-24
Q809	E-22
Q810	E-22
Q811	F-22
Q812	F-22
Q813	F-22
Q814	F-22
Q815	F-21
Q816	F-21

Note on Mounting Diagram:

• o—— : parts extracted from the component side.

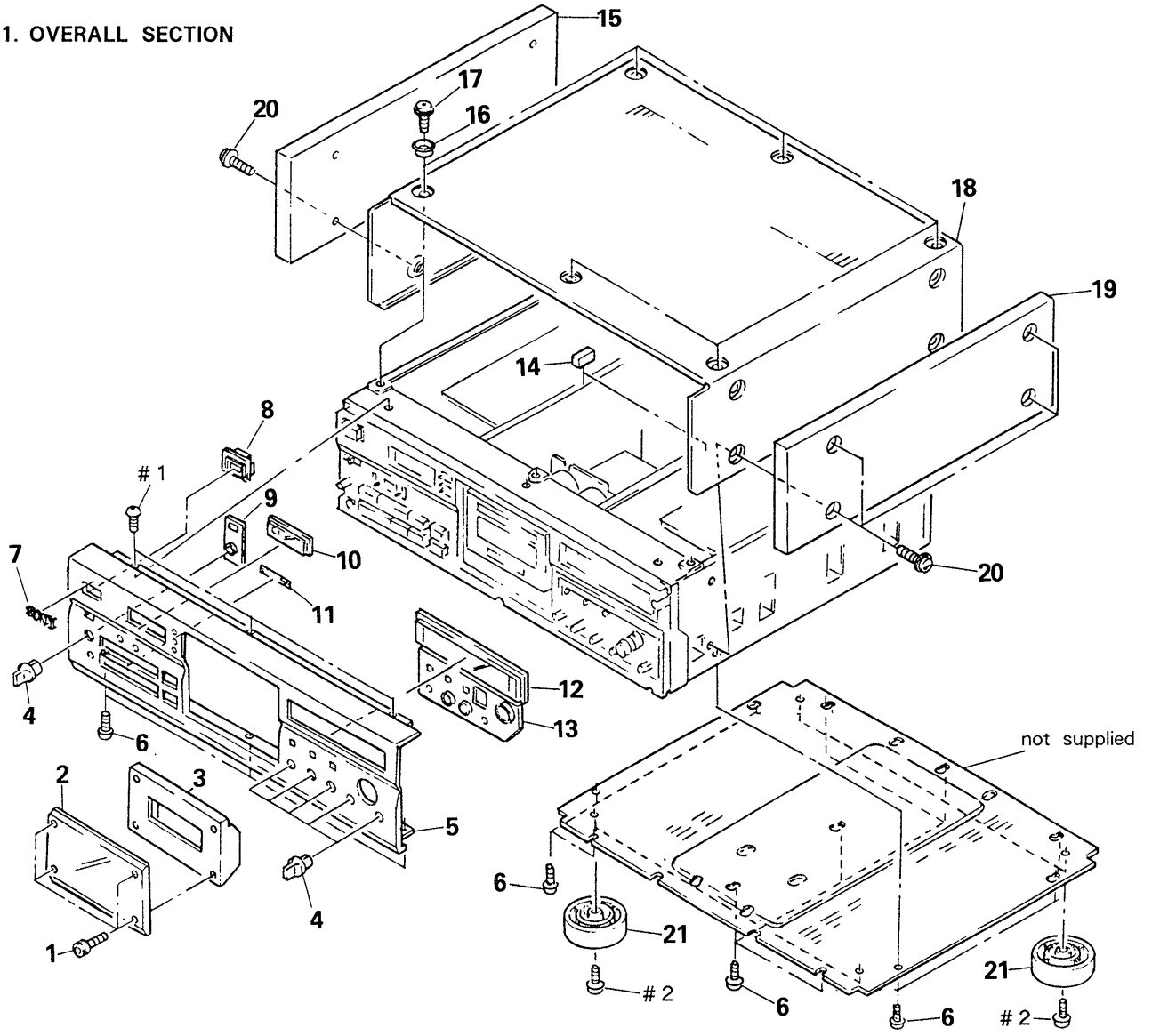
SECTION 5
EXPLODED VIEWS

NOTE :

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appearance Parts
  Example :
  KNOB, BALANCE (WHITE)...(RED)
  ↑ ↑
  Parts color Cabinet's color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

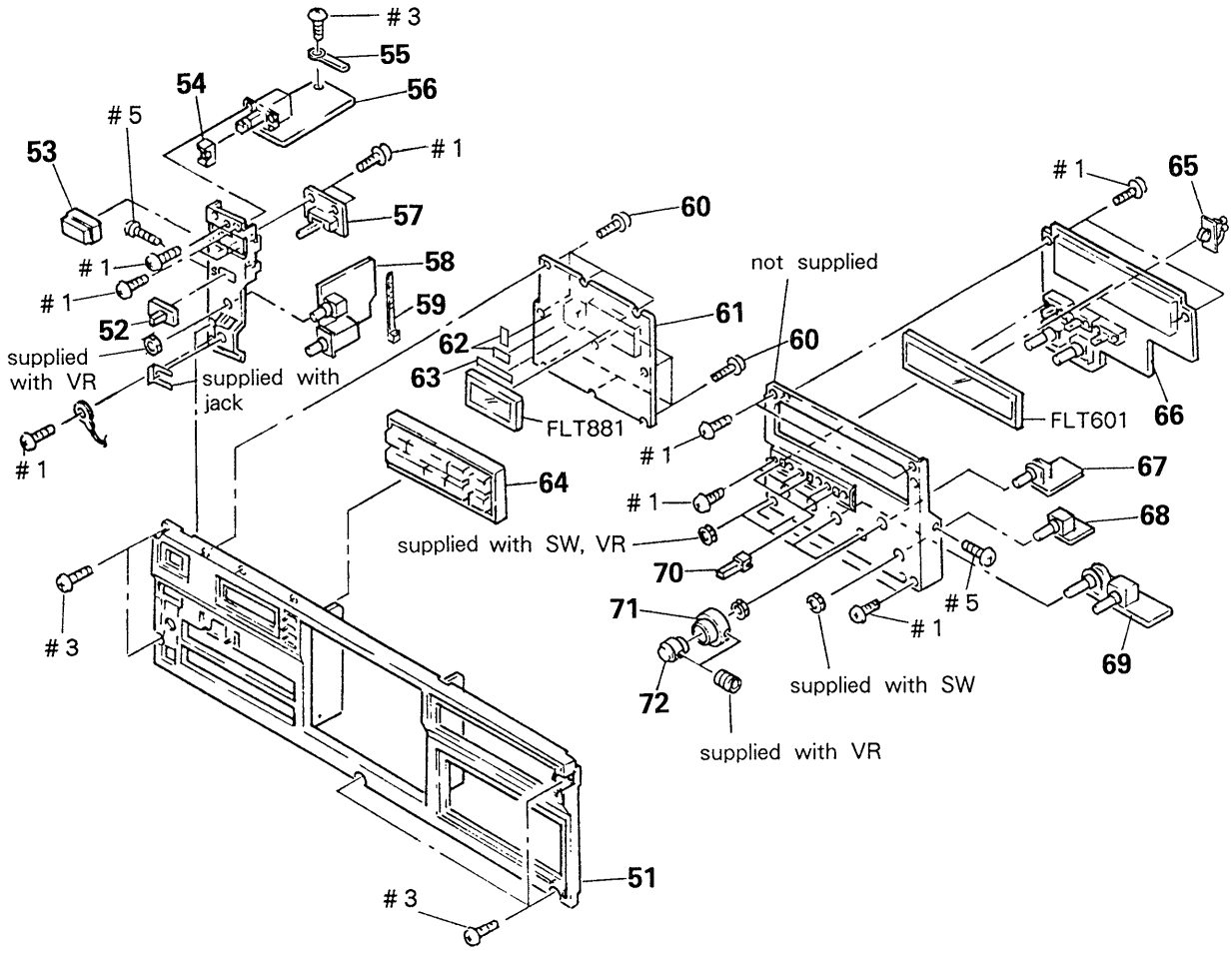
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1. OVERALL SECTION



Ref. No.	Part No.	Description	Remark
1	3-356-942-01	SCREW (2.6X6), TAPPING	
2	3-364-438-21	WINDOW, CASSETTE	
3	3-356-923-01	LID, CASSETTE	
4	X-3362-818-1	KNOB (DIA. 12) ASSY (B), SQUARE	
5	3-364-475-31	PANEL, FRONT	
6	3-703-685-21	SCREW (+BV 3X8)	
7	4-908-848-01	EMBLEM, SONY	
8	4-908-044-11	ESCUTCHEON, POWER KNOB	
9	3-364-444-01	ESCUTCHEON (L)	
10	3-364-442-11	WINDOW, COUNTER	
11	3-831-441-XX	PAPER, INTERCEPTION	
12	3-364-443-01	WINDOW, METER	
13	3-364-447-01	ESCUTCHEON (R)	
14	9-911-842-XX	CUSHION (S)	
15	X-3304-959-1	PANEL (LEFT) ASSY, SIDE	
16	4-923-474-01	RING, ORNAMENTAL	
17	3-704-366-01	SCREW (CASE) (M3X8)	
18	* 3-350-489-11	CASE	
19	X-3304-960-1	PANEL (RIGHT) ASSY, SIDE	
20	4-885-979-11	SCREW (4X25)	
21	X-3304-944-1	FOOT ASSY	

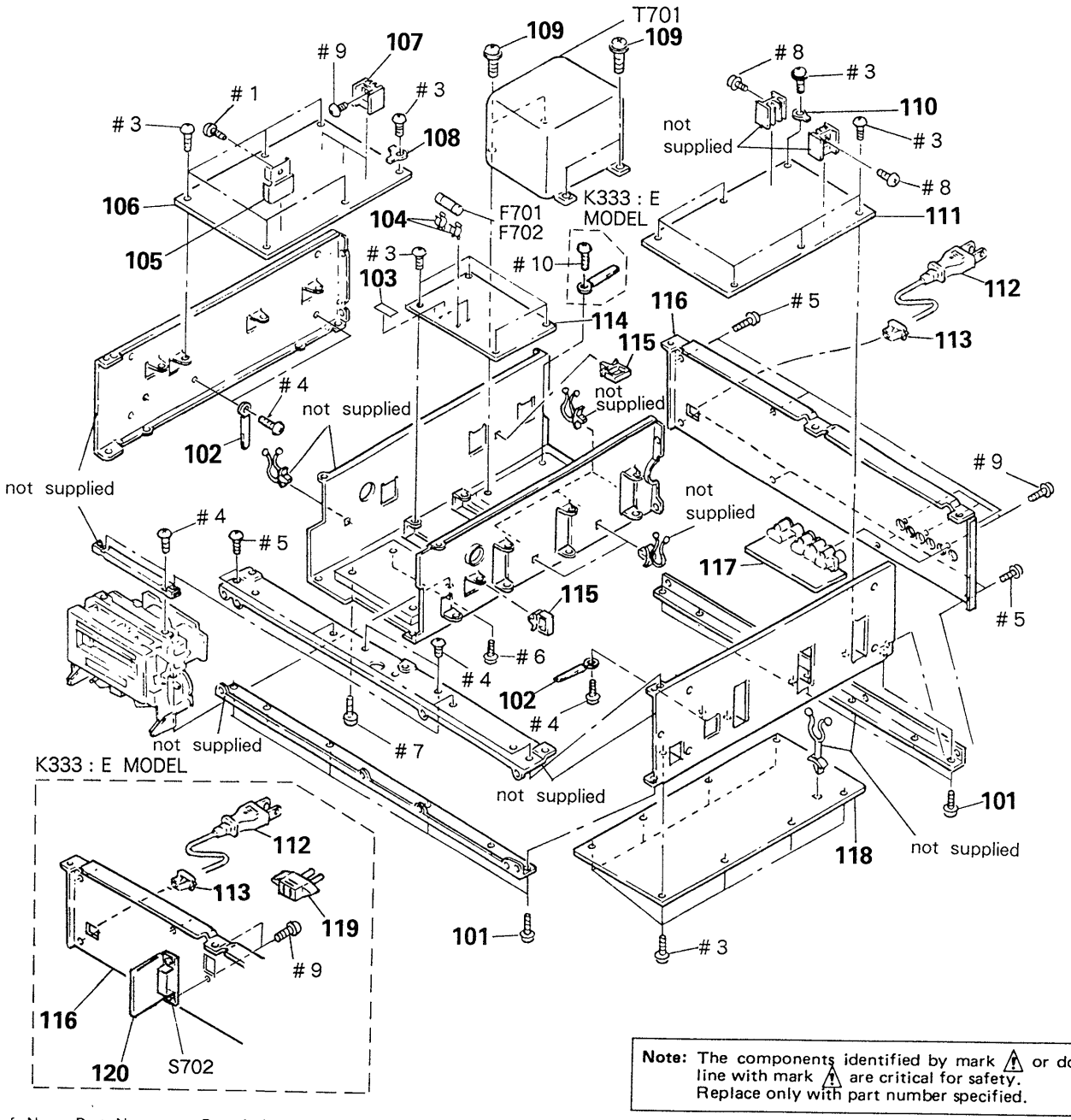
5-2. FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark
51	* 3-364-474-01	PANEL (BASE)	
52	4-922-518-11	KNOB (TIMER)	
53	4-908-046-01	KNOB, SQUARE	
54	4-864-307-00	RING	
55	3-703-150-11	STOPPER, WIRING	
56	* 1-637-517-11	AC SW BOADR	
57	* 1-637-518-11	TIMER SW BOARD	
58	* 1-637-521-11	H.P. AMP BOARD	
59	3-655-653-21	BAND (TAITON), BINDING	
60	4-928-635-01	SCREW, +BV (2.6X8) TAPPING	
61	* 1-637-516-11	COUNTER BOARD	

Ref. No.	Part No.	Description	Remark
62	3-831-441-XX	SPACER	
63	3-831-441-11	SPACER	
64	X-3362-327-1	BUTTON ASSY	
65	2-132-434-01	CLIP, WIRE	
66	* A-2006-355-A	METER BOARD	
67	* 1-637-519-11	REC VOL BOARD	
68	* 1-637-523-11	MONITOR SW BOARD	
69	* 1-637-520-11	REC EQ SW BOARD	
70	3-364-441-01	BUTTON	
71	3-364-440-01	KNOB (L)	
72	3-364-439-01	KNOB (R)	

5-3. CHASSIS SECTION

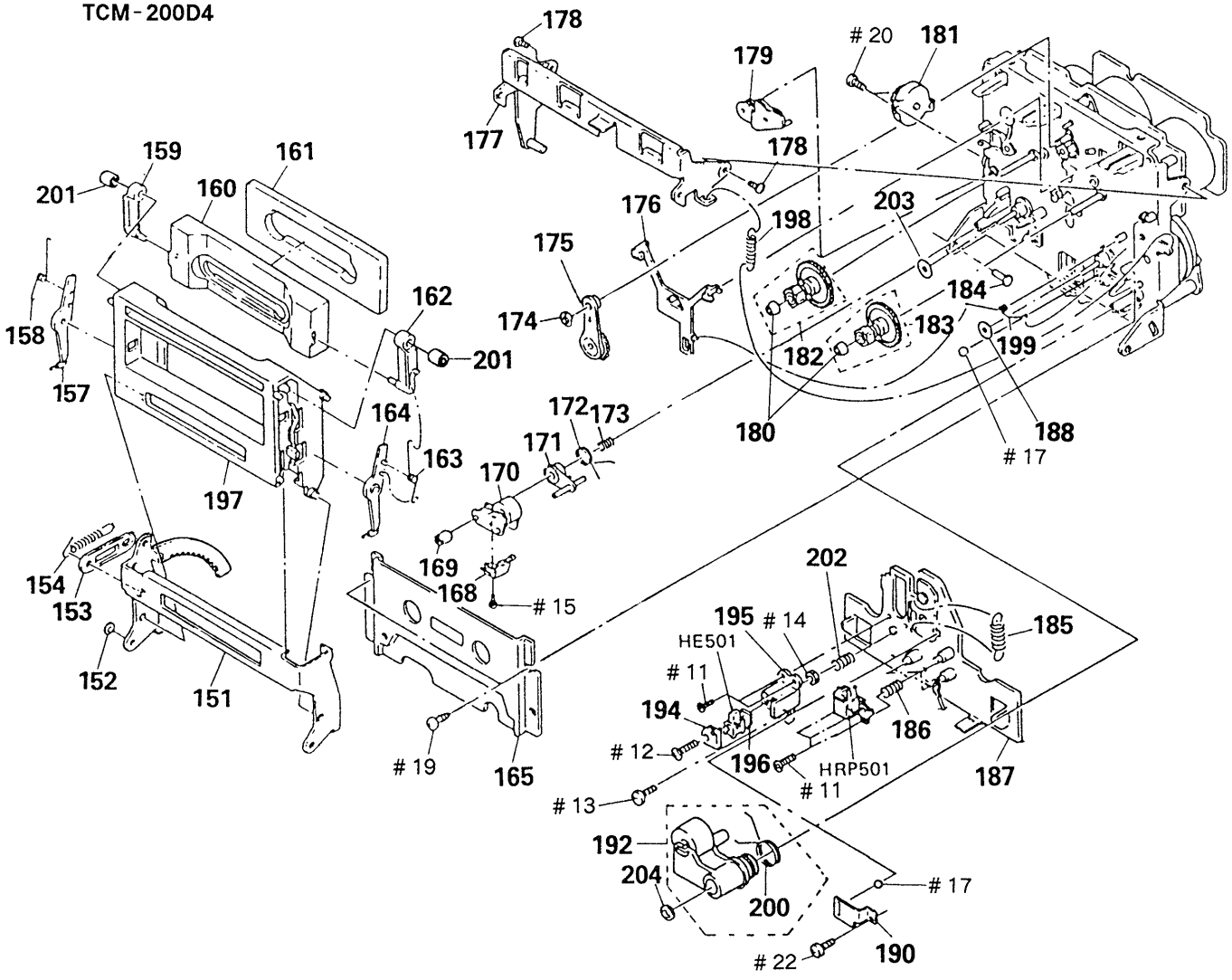


Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
101	3-703-685-21	SCREW (+BV 3X8)	
102	3-703-150-11	STOPPER, WIRING	
103	3-701-947-15	LABEL (T2.5A), FUSE	
104	* 1-533-213-31	HOLDER, FUSE	
105	* 3-356-925-01	HEAT SINK	
106	* A-2006-354-A	SYSCON BOARD	
107	* 4-363-146-21	HEAT SINK, V.OUT	
108	* 3-346-266-12	PLATE, GROUND	
109	4-820-330-31	SCREW (K970ES)	
	4-886-821-11	+PTTWH 3X6(S) (K333ESL:E)	
110	3-346-266-21	PLATE, GROUND	
111	A-2006-364-A	PB BOARD	
112	⚠1-574-383-11	CORD, POWER (K970ES)	
	⚠1-559-297-32	CORD, POWER (K333ESL:E)	
113	* 3-703-244-00	BUSHING (2104), CORD (K970ES)	
	* 4-916-783-01	BUSHING, CORD (K333ESL:E)	

Ref. No.	Part No.	Description	Remark
114	* 1-637-512-11	RECT. BOADR	
115	* 3-329-937-02	CLIP, WIRE	
116	* 3-350-482-21	PANEL, BACK (K970ES)	
	* 3-350-482-31	PANEL, BACK (K333ESL:E)	
117	* 1-637-522-11	PIN JACK BOARD	
118	A-2006-353-A	REC BOARD	
119	⚠1-569-007-11	ADAPTER, CONVERSION 2P (K333ESL:E)	
120	A-2006-513-3	V.S BOARD (K333ESL:E)	
F701	⚠1-532-286-00	FUSE, TIME-LAG (2.5A)	
F702	⚠1-532-286-00	FUSE, TIME-LAG (2.5A)	
S702	⚠1-157-009-11	SELECTOR, VOLTAGE (K333ESL:E)	
T701	⚠1-450-451-11	TRANSFORMER, POWER (K970ES)	
	⚠1-450-453-11	TRANSFORMER, POWER (K333ESL:E)	

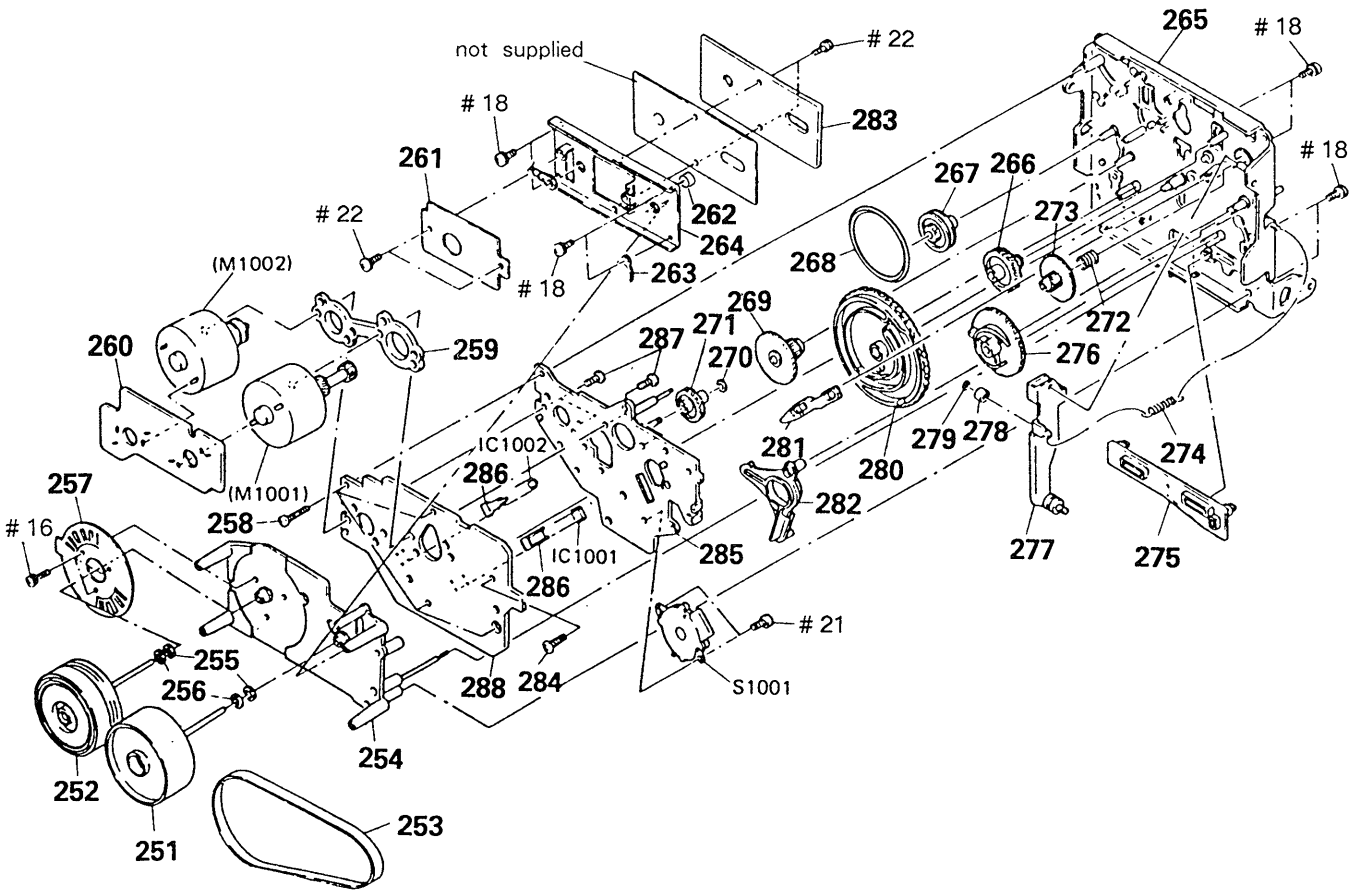
5-4. MECHANISM SECTION-1
TCM-200D4



Ref. No.	Part No.	Description	Remark
151	X-3362-671-1	HOLDER (BG) ASSY, CASSETTE	
152	3-558-708-21	WASHER, STOPPER	
153	* 3-356-717-01	LEVER (JOINT)	
154	3-356-626-01	SPRING, TENSION	
157	3-356-932-01	LEVER (LA)	
158	3-356-927-01	SPRING (LEFT), TORSION	
159	3-356-933-01	LEVER (LB)	
160	3-356-928-01	PLATE (A), ORNAMENTAL	
161	* 3-356-929-01	ABSORBENT, VIBRATION	
162	3-356-931-01	LEVER (RB)	
163	3-356-926-01	SPRING (RIGHT), TORSION	
164	3-356-930-01	LEVER (RA)	
165	X-3356-613-1	PLATE ASSY, ORNAMENTAL (IN CLUDED. SLF-325C	
168	3-564-138-00	GUIDE (S), TAPE	
169	3-356-652-01	NUT (PINCH LEVER S)	
170	X-3356-621-1	LEVER (PINCH LEVER S) ASSY	
171	3-356-660-01	LEVER (PS)	
172	3-356-661-01	SPRING (PINCH LEVER S), TORSION	
173	3-356-657-01	SPRING (PS), COMPRESSION	
174	3-669-465-00	WASHER (1.5), STOPPER	
175	X-3356-641-1	LEVER (FR2) ASSY	
176	3-356-614-01	SLIDER (BRAKE)	
177	* X-3356-608-1	LEVER (LIFTER) ASSY	
178	3-356-601-11	SCREW, STEP	

Ref. No.	Part No.	Description	Remark
179	X-3356-623-1	LEVER (BT) ASSY	
180	3-362-308-01	CAP (REEL)	
181	3-319-224-31	DAMPER, SMALL	
182	X-3356-629-1	GEAR (S) ASSY	
183	X-3356-627-1	GEAR (T) ASSY	
184	3-356-710-01	SHAFT (LEFT) (CASSETTE HOLDER)	
185	3-356-658-01	SPRING (LIMITER H), TENSION	
187	* X-3362-199-1	SLIDER (HEAD CHASSIS D) ASSY	
188	3-332-763-01	RING, OIL RESERVOIR	
190	3-356-656-01	SPRING (HEAD PC BOARD), LEAF	
192	X-3356-620-1	LEVER (PINCH LEVER T) ASSY	
194	3-318-433-01	SPRING	
195	* 3-576-977-00	BRACKET, E. HEAD	
196	* 1-608-268-00	PC BOARD, ERASE HEAD	
197	X-3356-611-1	HOLDER (A) ASSY, CASSETTE	
198	3-356-624-01	SPRING, TENSION	
199	3-356-619-01	SPRING (B), TORSION	
200	3-356-672-01	SPRING (PINCH LEVER T), TORSION	
201	3-356-946-01	BUSHING	
202	3-564-121-00	SPRING, COMPRESSION	
203	3-356-713-01	WASHER	
204	3-669-596-00	WASHER (2.3), STOPPER	
HE501	1-543-358-11	HEAD, MAGNETIC (ERASE)	
HRP501	1-543-684-11	HEAD, MAGNETIC (REC/PB)	

5-5. MECHANISM SECTION-2
TCM-200D4



Ref. No.	Part No.	Description	Remark
251	X-3362-284-1	FLYWHEEL (S2.3) ASSY	
252	X-3356-619-1	FLYWHEEL (DT) ASSY	
253	3-364-600-01	BELT (CAPSTAN)	
254	X-3362-281-1	CHASSIS (D2.3) ASSY	
255	3-356-705-31	WASHER (CAPSTAN)	
256	3-356-705-21	WASHER (CAPSTAN)	
257	1-632-779-11	PC BOARD, FG	
258	3-355-801-01	SCREW (BTP 2X18)	
259	* 3-356-628-01	SPACER (MOTOR)	
260	* 1-632-741-11	REEL MOTOR BOARD	
261	* 1-632-746-11	COMPARATOR BOARD	
262	3-364-135-01	RETAINER (S), THRUST	
263	* 3-701-822-00	HOLDER, WIRE	
264	* X-3362-282-1	BRACKET (THRUST RETAINER) ASSY	
265	X-3356-622-1	CHASSIS (C) ASSY, MECHANICAL	
266	3-356-703-01	GEAR (COMMUNICATION C)	
267	3-356-607-01	PULLEY (MODE)	
268	3-356-603-01	BELT (MODE)	
269	3-356-606-01	GEAR (MODE)	
270	3-669-465-00	WASHER (1.5), STOPPER	
271	3-356-702-01	GEAR (COMMUNICATION B)	

Ref. No.	Part No.	Description	Remark
272	3-356-605-01	SPRING, COMPRESSION	
273	3-356-609-01	GEAR (LOADING)	
274	3-356-625-01	SPRING, TENSION	
275	3-356-653-01	SLIDER (PAUSE)	
276	3-356-616-01	GEAR (LOADING CAM)	
277	* X-3356-606-1	LEVER (LOADING) ASSY	
278	3-356-630-01	ROLLER (LOADING)	
279	3-558-708-11	WASHER, STOPPER	
280	3-356-654-01	GEAR (MODE CAM C)	
281	3-356-617-01	LEVER (SELECTION)	
282	3-356-613-01	LEVER (MODE)	
283	A-2006-154-A	CAPSTAN C.O.C BOARD	
284	3-356-707-01	SCREW (+PTPWH 2X25)	
285	* X-3356-616-4	BRACKET (MOTOR D) ASSY	
286	3-356-631-01	HOLDER (SENSOR)	
287	3-363-804-01	SCREW (+P 2.6X6.5)	
288	* 1-632-740-11	MD BOARD	
IC1001	1-506-615-11	PIN, CONNECTOR 9P	
IC1002	1-564-501-11	PIN, CONNEDTOR 8P	
M1001	X-3356-638-1	MOTOR (REEL R) ASSY	
M1002	X-3356-604-1	MOTOR (ASSIST) ASSY	
S1001	1-466-238-11	ENCODER, ROTARY	

CAPSTAN C.O.C

COMPARATOR MD

SECTION 6
ELECTRICAL PARTS LIST

NOTE :

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be defferent from the parts specified in the diagrams or the components used on the set.
- −XX, −X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL : metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : μ, for example :
  uA... : μA... , uPA... , μPA... , uPB... , μPB... , uPC... , μPC... , uPD..., μPD...
- CAPACITORS :
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description				Remark
	A-2006-154-A	CAPSTAN C.O.C BOARD				
		**********				
		〈 CAPACITOR 〉				
C905	1-124-779-00	ELECT CHIP	10uF	20%	16v	
C906	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C907	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C908	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C909	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C910	1-163-205-00	CERAMIC CHIP	0.001uF	5%	50V	
C911	1-124-779-00	ELECT CHIP	10uF	20%	16v	
		〈 IC 〉				
H901	8-719-403-79	OH009-TW				
H902	8-719-403-79	OH009-TW				
H903	8-719-403-79	OH009-TW				
IC902	8-752-017-40	IC CX20174				
		〈 RESISTOR 〉				
R907	1-216-242-00	METAL GLAZE	68K	5%	1/8W	
R908	1-216-246-00	METAL GLAZE	100K	5%	1/8W	
R909	1-216-246-00	METAL GLAZE	100K	5%	1/8W	
R910	1-216-238-00	METAL GLAZE	47K	5%	1/8W	
R911	1-216-182-00	METAL GLAZE	220	5%	1/8W	
R912	1-216-182-00	METAL GLAZE	220	5%	1/8W	
R913	1-216-150-00	METAL GLAZE	10	5%	1/8W	
R914	1-216-150-00	METAL GLAZE	10	5%	1/8W	
R915	1-216-150-00	METAL GLAZE	10	5%	1/8W	
**********						
	* 1-632-746-11	COMPARATOR BOARD				
		**********				
		〈 CAPACITOR 〉				
C951	1-136-157-00	FILM	0.022uF	5%	50V	
C952	1-124-282-00	ELECT	22uF	20%	25V	
C953	1-124-478-11	ELECT	100uF	20%	25V	
C954	1-124-477-11	ELECT	47uF	20%	25V	
C955	1-162-203-31	CERAMIC	15PF	5%	50V	
C956	1-162-203-31	CERAMIC	15PF	5%	50V	
C957	1-136-159-00	FILM	0.033uF	5%	50V	
		〈 CONNECTOR 〉				
CN951	* 1-564-718-11	PIN, CONNECTOR (SMALL TYPE) 2P				
CN952	* 1-564-518-11	PLUG, CONNECTOR 3P				

Ref. No.	Part No.	Description				Remark
		〈 IC 〉				
IC951	8-759-945-58	IC RC4558P				
IC952	8-759-201-58	IC TC9142P				
		〈 RESISTOR 〉				
R951	1-249-413-11	CARBON	470	5%	1/4W	
R952	1-249-413-11	CARBON	470	5%	1/4W	
R953	1-247-881-00	CARBON	120K	5%	1/4W	
R954	1-247-881-00	CARBON	120K	5%	1/4W	
R955	1-249-429-11	CARBON	10K	5%	1/4W	
R956	1-249-417-11	CARBON	1K	5%	1/4W	
R957	1-249-417-11	CARBON	1K	5%	1/4W	
R958	1-247-891-00	CARBON	330K	5%	1/4W	
R959	1-247-901-11	CARBON	820K	5%	1/4W	
R960	1-249-441-11	CARBON	100K	5%	1/4W	
		〈 VIBRATOR 〉				
X951	1-577-615-11	VIBRATOR, CRYSTAL (4.934MHz)				
**********						
	* 1-632-740-11	MD BOARD				
		********				
	3-356-631-01	HOLDER (SENSOR)				
		〈 CONNECTOR 〉				
CN1001	1-506-615-11	PIN, CONNECTOR 9P				
CN1002	1-564-501-11	PIN, CONNECTOR 8P				
		〈 IC 〉				
IC1001	8-749-920-97	IC PHOTO REFLECTOR GP2S22B				
IC1002	8-749-920-97	IC PHOTO REFLECTOR GP2S22B				
		〈 RESISTOR 〉				
R1001	1-249-408-11	CARBON	180	5%	1/4W	
R1002	1-249-408-11	CARBON	180	5%	1/4W	
		〈 SWITCH 〉				
S1002	1-570-953-11	SWITCH, PUSH (1 KEY) (DOOR)				
S1003	1-571-958-11	SWITCH, PUSH (1 KEY) (CLOSE)				
S1004	1-572-126-11	SWITCH, PUSH (1 KEY) (OPEN)				
S1005	1-572-125-11	SWITCH, LEAF (FWD)				
S1006	1-572-202-11	SWITCH, LEAF (HALF)				
S1007	1-572-125-11	SWITCH, LEAF (METAL)				
S1008	1-572-125-11	SWITCH, LEAF (70U)				

MD | REAL MOTOR | PB | COUNTER | AC SW | TIMER SW | REC VOL | REC EQ SW | H.P. AMP | PIN JACK | MONITOR SW

Ref. No.	Part No.	Description			Remark
		⟨ PIN ⟩			
TB1001	* 1-569-066-11	PIN, CONNECTOR 5P			
**********					
	* 1-632-741-11	REAL MOTOR BOARD			
		**********			
		⟨ CAPACITOR ⟩			
C1051	1-124-907-11	ELECT	10uF	20%	50V
C1052	1-124-907-11	ELECT	10uF	20%	50V
C1053	1-164-159-11	CERAMIC	0.1uF		50V
		⟨ CONNECTOR ⟩			
CN1051	* 1-564-499-11	PIN, CONNECTOR 6P			
CN1052	* 1-564-718-11	PIN, CONNECTOR (SMALL TYPE) 2P			
CN1053	* 1-564-718-11	PIN, CONNECTOR (SMALL TYPE) 2P			
		⟨ RESISTOR ⟩			
R1051	1-249-412-11	CARBON	390	5%	1/4W
**********					
	* A-2006-364-A	PB BOARD			
		********			
	* 1-637-516-11	COUNTER BOARD			
		**********			
	* 1-637-517-11	AC SW BOARD			
		**********			
	* 1-637-518-11	TIMER SW BOARD			
		**********			
	* 1-637-519-11	REC VOL BOARD			
		**********			
	* 1-637-520-11	REC EQ SW BOARD			
		**********			
	* 1-637-521-11	H.P. AMP BOARD			
		**********			
	* 1-637-522-11	PIN JACK BOARD			
		**********			
	* 1-637-523-11	MONITOR SW BOARD			
		**********			
	7-682-147-15	SCREW, TR			
	* 3-346-266-21	PLATE, GROUND			
		⟨ CAPACITOR ⟩			
C101	1-136-252-00	FILM	0.0015uF	5%	100V
C102	1-107-169-00	MICA	100PF	5%	500V
C103	1-130-893-00	FILM	0.027uF	3%	100V
C104	1-124-130-00	ELECT	100uF	20%	63V
C105	1-124-929-11	ELECT	22uF	20%	100V
C106	1-124-929-11	ELECT	22uF	20%	100V

Ref. No.	Part No.	Description			Remark
C107	1-136-169-00	FILM	0.22uF	5%	50V
C108	1-136-230-00	FILM	0.0022uF	5%	100V
C109	1-136-230-00	FILM	0.0022uF	5%	100V
C110	1-136-230-00	FILM	0.0022uF	5%	100V
C111	1-136-230-00	FILM	0.0022uF	5%	100V
C112	1-136-230-00	FILM	0.0022uF	5%	100V
C113	1-130-475-00	MYLAR	0.0022uF	5%	50V
C114	1-130-475-00	MYLAR	0.0022uF	5%	50V
C115	1-130-478-00	MYLAR	0.0039uF	5%	50V
C116	1-136-173-00	FILM	0.47uF	5%	50V
C117	1-136-167-00	FILM	0.15uF	5%	50V
C118	1-136-155-00	FILM	0.015uF	5%	50V
C119	1-123-380-00	ELECT	1uF	20%	50V
C120	1-136-169-00	FILM	0.22uF	5%	50V
C121	1-136-163-00	FILM	0.068uF	5%	50V
C122	1-136-162-00	FILM	0.056uF	5%	50V
C123	1-123-380-00	ELECT	1uF	20%	50V
C124	1-130-480-00	MYLAR	0.0056uF	5%	50V
C125	1-136-153-00	FILM	0.01uF	5%	50V
C126	1-124-929-11	ELECT	22uF	20%	100V
C127	1-124-929-11	ELECT	22uF	20%	100V
C148	1-106-347-00	MYLAR	1500PF	5%	200V
C149	1-106-343-00	MYLAR	1000PF	5%	200V
C158	1-124-767-00	ELECT	2.2uF	20%	50V
C175	1-123-369-00	ELECT	4.7uF	20%	63V
C176	1-123-369-00	ELECT	4.7uF	20%	63V
C201	1-136-252-00	FILM	0.0015uF	5%	100V
C202	1-107-169-00	MICA	100PF	5%	500V
C203	1-130-893-00	FILM	0.027uF	3%	100V
C204	1-124-130-00	ELECT	100uF	20%	63V
C205	1-124-929-11	ELECT	22uF	20%	100V
C206	1-124-929-11	ELECT	22uF	20%	100V
C207	1-136-169-00	FILM	0.22uF	5%	50V
C208	1-136-230-00	FILM	0.0022uF	5%	100V
C209	1-136-230-00	FILM	0.0022uF	5%	100V
C210	1-136-230-00	FILM	0.0022uF	5%	100V
C211	1-136-230-00	FILM	0.0022uF	5%	100V
C212	1-136-230-00	FILM	0.0022uF	5%	100V
C213	1-130-475-00	MYLAR	0.0022uF	5%	50V
C214	1-130-475-00	MYLAR	0.0022uF	5%	50V
C215	1-130-478-00	MYLAR	0.0039uF	5%	50V
C216	1-136-173-00	FILM	0.47uF	5%	50V
C217	1-136-167-00	FILM	0.15uF	5%	50V
C218	1-136-155-00	FILM	0.015uF	5%	50V
C219	1-123-380-00	ELECT	1uF	20%	50V
C220	1-136-169-00	FILM	0.22uF	5%	50V
C221	1-136-163-00	FILM	0.068uF	5%	50V
C222	1-136-162-00	FILM	0.056uF	5%	50V
C223	1-123-380-00	ELECT	1uF	20%	50V
C224	1-130-480-00	MYLAR	0.0056uF	5%	50V
C225	1-136-153-00	FILM	0.01uF	5%	50V
C226	1-124-929-11	ELECT	22uF	20%	100V
C227	1-124-929-11	ELECT	22uF	20%	100V
C248	1-106-347-00	MYLAR	1500PF	5%	200V
C249	1-106-343-00	MYLAR	1000PF	5%	200V
C258	1-124-767-00	ELECT	2.2uF	20%	50V
C275	1-123-369-00	ELECT	4.7uF	20%	63V
C276	1-123-369-00	ELECT	4.7uF	20%	63V
C501	1-124-927-11	ELECT	4.7uF	20%	100V

PB | COUNTER | AC SW | TIMER SW | REC VOL | REC EQ SW | H.P. AMP | PIN JACK | MONITOR SW

Ref. No.	Part No.	Description				Remark
C502	1-136-165-00	FILM	0.1uF	5%	50V	
C503	1-162-284-31	CERAMIC	150PF	10%	50V	
C504	1-130-478-00	MYLAR	0.0039uF	5%	50V	
C505	1-124-902-00	ELECT	0.47uF	20%	50V	
C506	1-124-927-11	ELECT	4.7uF	20%	100V	
C507	1-124-922-11	ELECT	1000uF	20%	63V	
C508	1-107-159-00	MICA	33PF	5%	500V	
C509	1-126-066-11	ELECT	470uF	20%	63V	
C510	1-124-122-11	ELECT	100uF	20%	50V	
C511	1-124-922-11	ELECT	1000uF	20%	63V	
C512	1-107-159-00	MICA	33PF	5%	500V	
C513	1-126-066-11	ELECT	470uF	20%	63V	
C514	1-124-122-11	ELECT	100uF	20%	50V	
C518	1-124-122-11	ELECT	100uF	20%	50V	
C519	1-124-122-11	ELECT	100uF	20%	50V	
C601	1-131-368-00	TANTALUM	3.3uF	10%	16V	
C603	1-164-159-11	CERAMIC	0.1uF		50V	
C604	1-164-159-11	CERAMIC	0.1uF		50V	
C606	1-164-159-11	CERAMIC	0.1uF		50V	
C607	1-164-159-11	CERAMIC	0.1uF		50V	
C701	1-161-744-00	CERAMIC	0.01uF		400V	
C881	1-124-234-00	ELECT	22uF	20%	16V	
C882	1-126-096-11	ELECT	10uF	20%	35V	
C883	1-164-159-11	CERAMIC	0.1uF		50V	
		〈 CONNECTOR 〉				
CN598	* 1-560-061-00	PIN, CONNECTOR 3P				
CN599	* 1-560-061-00	PIN, CONNECTOR 3P				
CN701	* 1-564-321-00	PIN, CONNECTOR 2P				
CN702	* 1-564-321-00	PIN, CONNECTOR 2P				
CNE501	* 1-564-507-11	PLUG, CONNECTOR 4P				
CNE502	* 1-564-511-11	PLUG, CONNECTOR 8P				
CNE503	* 1-564-509-11	PLUG, CONNECTOR 6P				
CNE504	* 1-564-507-11	PLUG, CONNECTOR 4P				
CNE505	* 1-564-506-11	PLUG, CONNECTOR 3P				
CNN501	* 1-560-062-00	PIN, CONNECTOR 4P				
CNN502	* 1-560-062-00	PIN, CONNECTOR 4P				
CNN503	* 1-560-062-00	PIN, CONNECTOR 4P				
CNN504	* 1-560-065-00	PIN, CONNECTOR 8P				
CNS501	1-564-104-00	PIN, CONNECTOR 3P				
CNS502	1-564-104-00	PIN, CONNECTOR 3P				
		〈 COMPOSITION 〉				
CP601	1-232-881-11	COMPOSITION CIRCUIT BLOCK				
CP602	1-236-985-11	COMPOSITION CIRCUIT BLOCK				
		〈 DIODE 〉				
D501	8-719-107-94	DIODE 1SS202-1				
D502	8-719-107-94	DIODE 1SS202-1				
D503	8-719-114-29	DIODE RD5.1JS-B1				
D509	8-719-910-65	DIODE HZ6B2L				
D510	8-719-910-65	DIODE HZ6B2L				
D519	8-719-107-94	DIODE 1SS202-1				
D520	8-719-107-94	DIODE 1SS202-1				
D521	8-719-107-94	DIODE 1SS202-1				
D524	8-719-107-94	DIODE 1SS202-1				
D601	8-719-107-94	DIODE 1SS202-1				
D602	8-719-107-94	DIODE 1SS202-1				
D603	8-719-107-94	DIODE 1SS202-1				
D604	8-719-107-94	DIODE 1SS202-1				
D605	8-719-107-94	DIODE 1SS202-1				
D606	8-719-107-94	DIODE 1SS202-1				
D607	8-719-107-94	DIODE 1SS202-1				
D608	8-719-107-94	DIODE 1SS202-1				
D609	8-719-107-94	DIODE 1SS202-1				
D610	8-719-107-94	DIODE 1SS202-1				
D611	8-719-107-94	DIODE 1SS202-1				
D612	8-719-107-94	DIODE 1SS202-1				
D613	8-719-107-94	DIODE 1SS202-1				
D614	8-719-107-94	DIODE 1SS202-1				
D615	8-719-107-94	DIODE 1SS202-1				
D616	8-719-107-94	DIODE 1SS202-1				
D617	8-719-107-94	DIODE 1SS202-1				
D618	8-719-107-94	DIODE 1SS202-1				
D619	8-719-107-94	DIODE 1SS202-1				
D620	8-719-107-94	DIODE 1SS202-1				
D881	8-719-304-32	DIODE SEL4214S-C				
D882	8-719-312-65	DIODE SEL4814A-CD				
D883	8-719-304-37	DIODE SEL4414E-C				
		〈 FLUORESCENT INDICATOR 〉				
FLT601	1-519-629-11	INDICATOR TUBE, FLUORESCENT				
FLT881	1-519-630-11	INDICATOR TUBE, FLUORESCENT				
		〈 IC 〉				
IC101	8-759-900-72	IC NE5532P				
IC102	8-759-900-72	IC NE5532P				
IC201	8-759-900-72	IC NE5532P				
IC202	8-759-900-72	IC NE5532P				
IC501	8-759-900-72	IC NE5532P				
IC502	8-752-018-80	IC CX20188				
IC503	8-759-945-58	IC RC4558P				
IC507	8-759-511-57	IC ADJ712JN-SK				
IC601	8-759-635-68	IC M50940-313SP				
IC602	8-759-240-69	IC TC4069UBP				
IC881	8-759-322-98	IC HD404240A31S				
IC882	8-741-100-48	IC SBX1610-59				
		〈 JACK 〉				
J501	* 1-569-186-11	JACK, PIN 4P (LINE IN/CD DIRECTION)				
J502	* 1-568-250-21	JACK, PIN 2P (LINE OUT)				
J503	1-507-796-71	JACK (PHONES)				
		〈 TRANSISTOR 〉				
Q101	8-729-217-03	TRANSISTOR 2SK170-BL				
Q102	8-729-217-03	TRANSISTOR 2SK170-BL				
Q103	8-729-375-61	TRANSISTOR 2SD660-C				
Q104	8-729-201-56	TRANSISTOR 2SK246-GR2				
Q105	8-729-194-57	TRANSISTOR 2SC945-P				
Q106	8-729-141-30	TRANSISTOR 2SC3623A-LK				
Q201	8-729-217-03	TRANSISTOR 2SK170-BL				
Q202	8-729-217-03	TRANSISTOR 2SK170-BL				
Q203	8-729-375-61	TRANSISTOR 2SD666-C				
Q204	8-729-201-56	TRANSISTOR 2SK246-GR2				
Q205	8-729-194-57	TRANSISTOR 2SC945-P				
Q206	8-729-141-30	TRANSISTOR 2SC3623A-LK				
Q501	8-729-900-61	TRANSISTOR DTA114ES				
Q502	8-729-900-89	TRANSISTOR DTC144ES				
Q503	8-729-900-74	TRANSISTOR DTC143TS				

PB | COUNTER | AC SW | TIMER SW | REC VOL | REC EQ SW | H.P. AMP | PIN JACK | MONITOR SW

Ref. No.	Part No.	Description				Remark
Q504	8-729-620-05	TRANSISTOR	2SC2603-EF			
Q505	8-729-900-74	TRANSISTOR	DTC143TS			
Q506	8-729-900-89	TRANSISTOR	DTC144ES			
Q507	8-729-119-76	TRANSISTOR	2SA1175-HFE			
Q508	8-729-900-89	TRANSISTOR	DTC144ES			
Q509	8-729-107-53	TRANSISTOR	2SC2275A			
Q510	8-729-375-61	TRANSISTOR	2SD666A			
Q511	8-729-375-61	TRANSISTOR	2SD666A			
Q512	8-729-201-56	TRANSISTOR	2SK246-GR2			
Q513	8-729-190-53	TRANSISTOR	2SA985A			
Q514	8-729-371-61	TRANSISTOR	2SB716			
Q515	8-729-371-61	TRANSISTOR	2SB716			
Q516	8-729-201-56	TRANSISTOR	2SK246-GR2			
Q537	8-729-371-61	TRANSISTOR	2SB716			
Q538	8-729-375-61	TRANSISTOR	2SD666A			
Q601	8-729-900-61	TRANSISTOR	DTA114ES			
Q602	8-729-900-61	TRANSISTOR	DTA114ES			
Q603	8-729-900-65	TRANSISTOR	DTA144ES			
Q604	8-729-900-65	TRANSISTOR	DTA144ES			
Q605	8-729-900-65	TRANSISTOR	DTA144ES			
Q606	8-729-900-65	TRANSISTOR	DTA144ES			
Q607	8-729-900-65	TRANSISTOR	DTA144ES			
Q608	8-729-900-65	TRANSISTOR	DTA144ES			
Q609	8-729-900-89	TRANSISTOR	DTC144ES			
Q610	8-729-900-65	TRANSISTOR	DTA144ES			
Q611	8-729-900-65	TRANSISTOR	DTA144ES			
		〈 RESISTOR 〉				
R101	1-249-844-11	CARBON	56K	5%	1/2W	
R102	1-247-128-00	CARBON	750	5%	1/4W	
R103	1-247-128-00	CARBON	750	5%	1/4W	
R104	1-249-504-11	CARBON	10	5%	1/4W	
R105	1-247-708-11	CARBON	470	5%	1/4W	
R106	1-249-518-11	CARBON	39	5%	1/4W	
R107	1-247-721-11	CARBON	4.7K	5%	1/4W	
R108	1-247-704-11	CARBON	220	5%	1/4W	
R109	1-249-723-11	CARBON	120K	5%	1/2W	
R110	1-247-255-00	CARBON	4.3K	5%	1/2W	
R111	1-249-462-11	CARBON	22K	5%	1/4W	
R112	1-247-740-11	CARBON	120	5%	1/2W	
R113	1-249-658-11	CARBON	240	5%	1/2W	
R114	1-214-851-00	METAL	300	1%	1/2W	
R115	1-247-764-11	CARBON	10K	5%	1/2W	
R116	1-249-429-11	CARBON	10K	5%	1/4W	
R117	1-247-720-11	CARBON	3.9K	5%	1/4W	
R118	1-247-718-11	CARBON	2.7K	5%	1/4W	
R119	1-247-718-11	CARBON	2.7K	5%	1/4W	
R120	1-247-721-11	CARBON	4.7K	5%	1/4W	
R121	1-247-146-00	CARBON	4.3K	5%	1/4W	
R122	1-247-718-11	CARBON	2.7K	5%	1/4W	
R123	1-247-718-11	CARBON	2.7K	5%	1/4W	
R124	1-247-719-11	CARBON	3.3K	5%	1/4W	
R125	1-249-926-11	CARBON	1.3K	5%	1/4W	
R126	1-247-891-00	CARBON	330K	5%	1/4W	
R127	1-247-749-11	CARBON	560	5%	1/2W	
R128	1-247-764-11	CARBON	10K	5%	1/2W	
R129	1-247-146-00	CARBON	4.3K	5%	1/4W	
R130	1-247-142-00	CARBON	3K	5%	1/4W	

Ref. No.	Part No.	Description				Remark
R131	1-247-710-11	CARBON	560	5%	1/4W	
R132	1-246-545-00	CARBON	1.0M	5%	1/4W	
R133	1-249-462-11	CARBON	22K	5%	1/4W	
R134	1-247-152-00	CARBON	7.5K	5%	1/4W	
R135	1-247-711-11	CARBON	680	5%	1/4W	
R136	1-247-154-00	CARBON	9.1K	5%	1/4W	
R137	1-249-465-11	CARBON	47K	5%	1/4W	
R155	1-247-721-11	CARBON	4.7K	5%	1/4W	
R156	1-247-152-00	CARBON	8.2K	5%	1/4W	
R157	1-247-725-11	CARBON	10K	5%	1/4W	
R158	1-247-721-11	CARBON	4.7K	5%	1/4W	
R159	1-259-500-11	CARBON	1M	5%	1/6W	
R160	1-249-462-11	CARBON	22K	5%	1/4W	
R181	1-247-725-11	CARBON	10K	5%	1/4W	
R182	1-249-461-11	CARBON	18K	5%	1/4W	
R183	1-249-469-11	CARBON	100K	5%	1/4W	
R184	1-247-704-11	CARBON	220	5%	1/4W	
R190	1-247-749-11	CARBON	560	5%	1/2W	
R191	1-246-545-00	CARBON	1.0M	5%	1/4W	
R192	1-246-545-00	CARBON	1.0M	5%	1/4W	
R193	1-249-490-11	CARBON	27K	5%	1/2W	
R196	1-215-472-00	METAL	130K	1%	1/6W	
R201	1-249-844-11	CARBON	56K	5%	1/2W	
R202	1-247-128-00	CARBON	750	5%	1/4W	
R203	1-247-128-00	CARBON	750	5%	1/4W	
R204	1-249-504-11	CARBON	10	5%	1/4W	
R205	1-247-708-11	CARBON	470	5%	1/4W	
R206	1-249-518-11	CARBON	39	5%	1/4W	
R207	1-247-721-11	CARBON	4.7K	5%	1/4W	
R208	1-247-704-11	CARBON	220	5%	1/4W	
R209	1-249-723-11	CARBON	120K	5%	1/2W	
R210	1-247-255-00	CARBON	4.3K	5%	1/2W	
R211	1-249-462-11	CARBON	22K	5%	1/4W	
R212	1-247-740-11	CARBON	120	5%	1/2W	
R213	1-249-658-11	CARBON	240	5%	1/2W	
R214	1-214-851-00	METAL	300	1%	1/2W	
R215	1-247-764-11	CARBON	10K	5%	1/2W	
R216	1-249-429-11	CARBON	10K	5%	1/4W	
R217	1-247-720-11	CARBON	3.9K	5%	1/4W	
R218	1-247-718-11	CARBON	2.7K	5%	1/4W	
R219	1-247-718-11	CARBON	2.7K	5%	1/4W	
R220	1-247-721-11	CARBON	4.7K	5%	1/4W	
R221	1-247-146-00	CARBON	4.3K	5%	1/4W	
R222	1-247-718-11	CARBON	2.7K	5%	1/4W	
R223	1-247-718-11	CARBON	2.7K	5%	1/4W	
R224	1-247-719-11	CARBON	3.3K	5%	1/4W	
R225	1-249-926-11	CARBON	1.3K	5%	1/4W	
R226	1-247-891-00	CARBON	330K	5%	1/4W	
R227	1-247-749-11	CARBON	560	5%	1/2W	
R228	1-247-764-11	CARBON	10K	5%	1/2W	
R229	1-247-146-00	CARBON	4.3K	5%	1/4W	
R230	1-247-142-00	CARBON	3K	5%	1/4W	
R231	1-247-710-11	CARBON	560	5%	1/4W	
R232	1-246-545-00	CARBON	1.0M	5%	1/4W	
R233	1-249-462-11	CARBON	22K	5%	1/4W	
R234	1-247-152-00	CARBON	7.5K	5%	1/4W	
R235	1-247-711-11	CARBON	680	5%	1/4W	
R236	1-247-154-00	CARBON	9.1K	5%	1/4W	
R237	1-249-465-11	CARBON	47K	5%	1/4W	
R255	1-247-721-11	CARBON	4.7K	5%	1/4W	

PB | COUNTER | AC SW | TIMER SW | REC VOL | REC EQ SW | H.P. AMP | PIN JACK | MONITOR SW

Ref. No.	Part No.	Description				Remark
R256	1-247-152-00	CARBON	8.2K	5%	1/4W	
R257	1-247-725-11	CARBON	10K	5%	1/4W	
R258	1-247-721-11	CARBON	4.7K	5%	1/4W	
R259	1-259-500-11	CARBON	1M	5%	1/6W	
R260	1-249-462-11	CARBON	22K	5%	1/4W	
R281	1-247-725-11	CARBON	10K	5%	1/4W	
R282	1-249-461-11	CARBON	18K	5%	1/4W	
R283	1-249-469-11	CARBON	100K	5%	1/4W	
R284	1-247-704-11	CARBON	220	5%	1/4W	
R290	1-247-749-11	CARBON	560	5%	1/2W	
R291	1-246-545-00	CARBON	1.0M	5%	1/4W	
R292	1-246-545-00	CARBON	1.0M	5%	1/4W	
R293	1-249-490-11	CARBON	27K	5%	1/2W	
R321	1-249-824-11	CARBON	8.2K	5%	1/2W	
R322	1-259-500-11	CARBON	1M	5%	1/6W	
R323	1-259-436-11	CARBON	2.2K	5%	1/6W	
R421	1-249-824-11	CARBON	8.2K	5%	1/2W	
R422	1-259-500-11	CARBON	1M	5%	1/6W	
R423	1-259-436-11	CARBON	2.2K	5%	1/6W	
R501	1-249-434-11	CARBON	27K	5%	1/4W	
R502	1-249-429-11	CARBON	10K	5%	1/4W	
R503	1-249-425-11	CARBON	4.7K	5%	1/4W	
R504	1-249-433-11	CARBON	22K	5%	1/4W	
R506	1-249-429-11	CARBON	10K	5%	1/4W	
R507	1-249-417-11	CARBON	1K	5%	1/4W	
R508	1-249-435-11	CARBON	33K	5%	1/4W	
R509	1-249-429-11	CARBON	10K	5%	1/4W	
R510	1-249-425-11	CARBON	4.7K	5%	1/4W	
R511	1-249-417-11	CARBON	1K	5%	1/4W	
R512	1-249-434-11	CARBON	27K	5%	1/4W	
R513	1-249-429-11	CARBON	10K	5%	1/4W	
R514	1-249-441-11	CARBON	100K	5%	1/4W	
R515	1-249-417-11	CARBON	1K	5%	1/4W	
R516	1-249-433-11	CARBON	22K	5%	1/4W	
R517	1-249-431-11	CARBON	15K	5%	1/4W	
R518	1-249-429-11	CARBON	10K	5%	1/4W	
R519	1-249-433-11	CARBON	22K	5%	1/4W	
R521	1-247-749-11	CARBON	560	5%	1/2W	
R522	1-249-673-11	CARBON	1K	5%	1/2W	
R523	1-247-719-11	CARBON	3.3K	5%	1/4W	
R524	1-249-547-11	CARBON	620	5%	1/4W	
R525	1-249-466-11	CARBON	56K	5%	1/4W	
R526	1-249-673-11	CARBON	1K	5%	1/2W	
R527	1-247-749-11	CARBON	560	5%	1/2W	
R528	1-247-719-11	CARBON	3.3K	5%	1/4W	
R529	1-249-547-11	CARBON	620	5%	1/4W	
R530	1-249-466-11	CARBON	56K	5%	1/4W	
R570	1-249-433-11	CARBON	22K	5%	1/4W	
R571	1-249-429-11	CARBON	10K	5%	1/4W	
R574	1-249-429-11	CARBON	10K	5%	1/4W	
R577	1-247-714-11	CARBON	1.2K	5%	1/4W	
R578	1-247-704-11	CARBON	220	5%	1/4W	
R579	1-247-714-11	CARBON	1.2K	5%	1/4W	
R580	1-247-704-11	CARBON	220	5%	1/4W	
R581	1-247-700-11	CARBON	100	5%	1/4W	
R582	1-247-700-11	CARBON	100	5%	1/4W	
R599	1-247-764-11	CARBON	10K	5%	1/2W	
R601	1-249-441-11	CARBON	100K	5%	1/4W	
R602	1-249-441-11	CARBON	100K	5%	1/4W	
R603	1-249-425-11	CARBON	4.7K	5%	1/4W	

Ref. No.	Part No.	Description				Remark
R604	1-247-903-00	CARBON	1M	5%	1/4W	
R605	1-247-895-00	CARBON	470K	5%	1/4W	
R606	1-249-433-11	CARBON	22K	5%	1/4W	
R607	1-249-433-11	CARBON	22K	5%	1/4W	
R608	1-249-437-11	CARBON	47K	5%	1/4W	
R609	1-249-437-11	CARBON	47K	5%	1/4W	
R610	1-249-437-11	CARBON	47K	5%	1/4W	
R611	1-249-437-11	CARBON	47K	5%	1/4W	
R612	1-249-437-11	CARBON	47K	5%	1/4W	
R613	1-249-437-11	CARBON	47K	5%	1/4W	
R614	1-249-421-11	CARBON	2.2K	5%	1/4W	
R615	1-249-421-11	CARBON	2.2K	5%	1/4W	
R616	1-249-429-11	CARBON	10K	5%	1/4W	
R617	1-249-437-11	CARBON	47K	5%	1/4W	
R618	1-247-842-11	CARBON	3K	5%	1/4W	
R619	1-249-426-11	CARBON	5.6K	5%	1/4W	
R620	1-249-437-11	CARBON	47K	5%	1/4W	
R621	1-249-421-11	CARBON	2.2K	5%	1/4W	
R622	1-249-421-11	CARBON	2.2K	5%	1/4W	
R699	1-247-764-11	CARBON	10K	5%	1/2W	
R881	1-247-903-00	CARBON	1M	5%	1/4W	
R882	1-249-433-11	CARBON	22K	5%	1/4W	
R883	1-249-425-11	CARBON	4.7K	5%	1/4W	
R884	1-249-425-11	CARBON	4.7K	5%	1/4W	
R885	1-249-422-11	CARBON	2.7K	5%	1/4W	
R886	1-249-424-11	CARBON	3.9K	5%	1/4W	
R887	1-249-422-11	CARBON	2.7K	5%	1/4W	
R888	1-249-424-11	CARBON	3.9K	5%	1/4W	
R889	1-249-428-11	CARBON	8.2K	5%	1/4W	
R890	1-249-434-11	CARBON	27K	5%	1/4W	
R891	1-249-422-11	CARBON	2.7K	5%	1/4W	
R892	1-249-424-11	CARBON	3.9K	5%	1/4W	
R893	1-249-428-11	CARBON	8.2K	5%	1/4W	
R894	1-249-434-11	CARBON	27K	5%	1/4W	
R895	1-249-424-11	CARBON	3.9K	5%	1/4W	

〈 VARIABLE RESISTOR 〉

RV101	1-224-550-21	RES, ADJ, METAL GLAZE 220
RV201	1-224-550-21	RES, ADJ, METAL GLAZE 220
RV501	1-230-344-11	RES, VAR, CARBON 20K/20K
RV502	1-238-840-11	RES, VAR, CARBON 5K/5K
RV503	1-241-336-11	RES, VAR, CARBON 20K/20K
RV601	1-241-335-11	RES, VAR , CARBON 5K

〈 RELAY 〉

RY503	1-515-803-11	RELAY

〈 SWITCH 〉

S501	1-572-589-11	SWITCH, ROTARY (REC EQ CAL)
S601	1-572-339-11	SWITCH, PUSH (1 KEY) (HX PRO)
S602	1-572-339-11	SWITCH, PUSH (1 KEY) (CAL IBRATION)
S603	1-554-833-11	SWITCH, PUSH (1 KEY) (INPUT:CD/LINE)
S604	1-572-588-11	SWITCH, ROTARY (DOLBY NR)
S605	1-572-590-11	SWITCH, ROTARY (MONITOR)
S701	⚠1-572-267-21	SWITCH, PUSH (AC POWER)(1 KEY)(POWER)
S881	1-554-303-21	SWITCH, TACTILE (RESET)
S882	1-554-303-21	SWITCH, TACTILE (MEMORY)
S883	1-554-303-21	SWITCH, TACTILE (DISPLAY MODE)

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

PB | COUNTER | AC SW | TIMER SW | REC VOL | REC EQ SW | H.P. AMP | PIN JACK | MONITOR SW | RECT.

Ref. No.	Part No.	Description	Remark
S884	1-554-303-21	SWITCH, TACTILE (⏏)	
S885	1-554-303-21	SWITCH, TACTILE (■)	
S886	1-554-303-21	SWITCH, TACTILE (◀◀)	
S887	1-554-303-21	SWITCH, TACTILE (▶▶)	
S888	1-554-303-21	SWITCH, TACTILE (●)	
S889	1-554-303-21	SWITCH, TACTILE (▶)	
S890	1-554-303-21	SWITCH, TACTILE (▮▮)	
S891	1-554-303-21	SWITCH, TACTILE (⏮)	
S892	1-554-303-21	SWITCH, TACTILE (⏭)	
S893	1-554-303-21	SWITCH, TACTILE (O)	
S894	1-570-903-11	SWITCH, SLIDE (TIMER)	
		⟨ VIBRATOR ⟩	
X601	1-577-358-21	VIBRATOR, CERAMIC	
X881	1-577-358-21	VIBRATOR, CERAMIC	

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*	1-637-512-11	RECT. BOARD	
		**********	
*	1-533-213-31	HOLDER, FUSE	
*	3-346-266-12	PLATE, GROUND	
*	3-356-925-01	HEAT SINK	
*	4-363-146-21	HEAT SINK, V.OUT	
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3	
	7-682-547-04	SCREW +BVTT 3X6 (S)	
		⟨ CAPACITOR ⟩	

C128	1-123-369-00	ELECT	4.7uF	20%	63V
C129	1-123-369-00	ELECT	4.7uF	20%	63V
C130	1-124-767-00	ELECT	2.2uF	20%	50V
C131	1-107-159-00	MICA	33PF	5%	500V
C132	1-107-159-00	MICA	33PF	5%	500V
C133	1-130-475-00	MYLAR	0.0022uF	5%	50V
C134	1-130-475-00	MYLAR	0.0022uF	5%	50V
C135	1-130-478-00	MYLAR	0.0039uF	5%	50V
C136	1-136-173-00	FILM	0.47uF	5%	50V
C137	1-136-167-00	FILM	0.15uF	5%	50V
C138	1-136-155-00	FILM	0.015uF	5%	50V
C139	1-123-380-00	ELECT	1uF	20%	50V
C140	1-136-169-00	FILM	0.22uF	5%	50V
C141	1-136-163-00	FILM	0.068uF	5%	50V
C142	1-136-162-00	FILM	0.056uF	5%	50V
C143	1-123-380-00	ELECT	1uF	20%	50V
C144	1-130-480-00	MYLAR	0.0056uF	5%	50V
C145	1-136-153-00	FILM	0.01uF	5%	50V
C146	1-124-929-11	ELECT	22uF	20%	100V
C147	1-124-929-11	ELECT	22uF	20%	100V
C150	1-136-252-00	FILM	0.0015uF	5%	100V
C151	1-124-915-11	ELECT	10uF	20%	63V
C152	1-136-163-00	FILM	0.068uF	5%	50V
C153	1-130-485-00	MYLAR	0.015uF	5%	50V
C154	1-136-160-00	FILM	0.039uF	5%	50V

Ref. No.	Part No.	Description			Remark
C155	1-130-485-00	MYLAR	0.015uF	5%	50V
C156	1-136-160-00	FILM	0.039uF	5%	50V
C157	1-130-486-00	MYLAR	0.018uF	10%	50V
C159	1-124-929-11	ELECT	22uF	20%	100V
C160	1-136-252-00	FILM	0.0015uF	5%	100V
C161	1-107-157-00	MICA	27PF	5%	500V
C162	1-107-159-00	MICA	33PF	5%	500V
C163	1-107-169-00	MICA	100PF	5%	500V
C164	1-109-627-00	MICA	150PF	2%	500V
C165	1-109-621-00	MICA	220PF	1%	500V
C166	1-136-153-00	FILM	0.01uF	5%	50V
C167	1-136-163-00	FILM	0.068uF	5%	50V
C168	1-136-157-00	FILM	0.022uF	5%	50V
C170	1-124-925-11	ELECT	2.2uF	20%	100V
C171	1-123-382-00	ELECT	3.3uF	20%	100V
C173	1-124-925-11	ELECT	2.2uF	20%	100V
C174	1-136-165-00	FILM	0.1uF	5%	50V
C228	1-123-369-00	ELECT	4.7uF	20%	63V
C229	1-123-369-00	ELECT	4.7uF	20%	63V
C230	1-124-767-00	ELECT	2.2uF	20%	50V
C231	1-107-159-00	MICA	33PF	5%	500V
C232	1-107-159-00	MICA	33PF	5%	500V
C233	1-130-475-00	MYLAR	0.0022uF	5%	50V
C234	1-130-475-00	MYLAR	0.0022uF	5%	50V
C235	1-130-478-00	MYLAR	0.0039uF	5%	50V
C236	1-136-173-00	FILM	0.47uF	5%	50V
C237	1-136-167-00	FILM	0.15uF	5%	50V
C238	1-136-155-00	FILM	0.015uF	5%	50V
C239	1-123-380-00	ELECT	1uF	20%	50V
C240	1-136-169-00	FILM	0.22uF	5%	50V
C241	1-136-163-00	FILM	0.068uF	5%	50V
C242	1-136-162-00	FILM	0.056uF	5%	50V
C243	1-123-380-00	ELECT	1uF	20%	50V
C244	1-130-480-00	MYLAR	0.0056uF	5%	50V
C245	1-136-153-00	FILM	0.01uF	5%	50V
C246	1-124-929-11	ELECT	22uF	20%	100V
C247	1-124-929-11	ELECT	22uF	20%	100V
C250	1-136-252-00	FILM	0.0015uF	5%	100V
C251	1-124-915-11	ELECT	10uF	20%	63V
C252	1-136-163-00	FILM	0.068uF	5%	50V
C253	1-130-485-00	MYLAR	0.015uF	5%	50V
C254	1-136-160-00	FILM	0.039uF	5%	50V
C255	1-130-485-00	MYLAR	0.015uF	5%	50V
C256	1-136-160-00	FILM	0.039uF	5%	50V
C257	1-130-486-00	MYLAR	0.018uF	10%	50V
C259	1-124-929-11	ELECT	22uF	20%	100V
C260	1-136-252-00	FILM	0.0015uF	5%	100V
C261	1-107-157-00	MICA	27PF	5%	500V
C262	1-107-159-00	MICA	33PF	5%	500V
C263	1-107-169-00	MICA	100PF	5%	500V
C264	1-109-627-00	MICA	150PF	2%	500V
C265	1-109-621-00	MICA	220PF	1%	500V
C266	1-136-153-00	FILM	0.01uF	5%	50V
C267	1-136-163-00	FILM	0.068uF	5%	50V
C268	1-136-157-00	FILM	0.022uF	5%	50V
C270	1-124-925-11	ELECT	2.2uF	20%	100V
C271	1-123-382-00	ELECT	3.3uF	20%	100V
C272	1-161-375-00	CERAMIC	0.0022uF	20%	50V
C273	1-124-925-11	ELECT	2.2uF	20%	100V
C515	1-124-907-11	ELECT	10uF	20%	50V

RECT.

Ref. No.	Part No.	Description				Remark
C516	1-123-369-00	ELECT	4.7uF	20%	63V	
C517	1-123-369-00	ELECT	4.7uF	20%	63V	
C520	1-123-369-00	ELECT	4.7uF	20%	63V	
C521	1-124-477-11	ELECT	47uF	20%	25V	
C522	1-123-369-00	ELECT	4.7uF	20%	63V	
C523	1-124-477-11	ELECT	47uF	20%	25V	
C524	1-124-903-11	ELECT	1uF	20%	50V	
C525	1-124-907-11	ELECT	10uF	20%	50V	
C528	1-107-026-00	MICA	5.1PF		500V	
C529	1-124-477-11	ELECT	47uF	20%	25V	
C530	1-124-925-11	ELECT	2.2uF	20%	100V	
C531	1-124-915-11	ELECT	10uF	20%	63V	
C532	1-124-477-11	ELECT	47uF	20%	25V	
C533	1-124-915-11	ELECT	10uF	20%	63V	
C534	1-124-477-11	ELECT	47uF	20%	25V	
C535	1-124-477-11	ELECT	47uF	20%	25V	
C536	1-124-477-11	ELECT	47uF	20%	25V	
C537	1-130-474-00	MYLAR	0.0018uF	5%	50V	
C538	1-130-474-00	MYLAR	0.0018uF	5%	50V	
C539	1-136-157-00	FILM	0.022uF	5%	50V	
C540	1-136-157-00	FILM	0.022uF	5%	50V	
C541	1-124-907-11	ELECT	10uF	20%	50V	
C542	1-126-233-11	ELECT	22uF	20%	50V	
C543	1-162-217-31	CERAMIC	56PF	5%	50V	
C544	1-162-217-31	CERAMIC	56PF	5%	50V	
C545	1-124-477-11	ELECT	47uF	20%	25V	
C546	1-164-159-11	CERAMIC	0.1uF		50V	
C702	1-136-165-00	FILM	0.1uF	5%	50V	
C703	1-136-177-00	FILM	1uF	5%	50V	
C704	1-126-982-11	ELECT	5600uF	20%	0	
C705	1-126-982-11	ELECT	5600uF	20%	0	
C706	1-124-636-00	ELECT	3300uF	20%	25V	
C707	1-124-120-11	ELECT	220uF	20%	25V	
C708	1-124-479-11	ELECT	330uF	20%	25V	
C709	1-124-911-11	ELECT	220uF	20%	50V	
C710	1-124-767-00	ELECT	2.2uF	20%	50V	
C711	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C712	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C751	1-124-636-00	ELECT	3300uF	20%	25V	
C752	1-124-907-11	ELECT	10uF	20%	50V	
C753	1-124-122-11	ELECT	100uF	20%	50V	
C754	1-124-927-11	ELECT	4.7uF	20%	100V	
C755	1-126-101-11	ELECT	100uF	20%	16V	
C756	1-124-898-11	ELECT	4700uF	20%	16V	
C757	1-124-907-11	ELECT	10uF	20%	50V	
C758	1-162-211-31	CERAMIC	33PF	5%	50V	
C759	1-124-472-11	ELECT	470uF	20%	10V	
C760	1-124-903-11	ELECT	1uF	20%	50V	
C761	1-124-471-00	ELECT	1000uF	20%	6.3V	
C762	1-124-903-11	ELECT	1uF	20%	50V	
C763	1-124-903-11	ELECT	1uF	20%	50V	
C764	1-124-443-00	ELECT	100uF	20%	10V	
C765	1-124-907-11	ELECT	10uF	20%	50V	
C766	1-124-122-11	ELECT	100uF	20%	50V	
C767	1-124-443-00	ELECT	100uF	20%	10V	
C801	1-164-159-11	CERAMIC	0.1uF		50V	
C802	1-164-159-11	CERAMIC	0.1uF		50V	
C803	1-124-477-11	ELECT	47uF	20%	25V	
C804	1-124-907-11	ELECT	10uF	20%	50V	
C805	1-124-443-00	ELECT	100uF	20%	10V	

Ref. No.	Part No.	Description				Remark
C806	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C807	1-162-294-31	CERAMIC	0.001uF	10%	50V	
		〈 CONNECTOR 〉				
CN703	* 1-564-104-00	PIN, CONNECTOR 3P				
CN704	* 1-564-506-11	PLUG, CONNECTOR 3P				
CN705	* 1-564-506-11	PLUG, CONNECTOR 3P				
CN751	* 1-564-511-11	PLUG, CONNECTOR 8P				
CN801	* 1-564-336-00	PIN, CONNECTOR 2P				
CN802	* 1-564-341-11	PIN, CONNECTOR 7P				
CN803	* 1-506-503-71	PIN, CONNECTOR 9P				
CN804	* 1-506-503-11	PIN, CONNECTOR 9P				
CN805	* 1-564-339-00	PIN, CONNECTOR 5P				
CN806	* 1-564-666-11	PIN, CONNECTOR 10P				
CN807	* 1-564-342-61	PIN, CONNECTOR 8P				
CN809	* 1-506-503-11	PIN, CONNECTOR 9P				
CND501	* 1-564-340-00	PIN, CONNECTOR 6P				
CND502	* 1-564-341-11	PIN, CONNECTOR 7P				
CNE101	* 1-564-507-11	PLUG, CONNECTOR 4P				
CNE201	* 1-564-507-11	PLUG, CONNECTOR 4P				
CNE504	* 1-564-506-11	PLUG, CONNECTOR 3P				
CNN505	* 1-560-062-00	PIN, CONNECTOR 4P				
CNN506	* 1-560-061-00	PIN, CONNECTOR 3P				
		〈 OSCILLATION UNIT 〉				
CP501	1-466-252-11	OSCILLATION UNIT, BIAS				
		〈 DIODE 〉				
D101	8-719-000-60	DIODE	UZL-6M2			
D102	8-719-107-94	DIODE	1SS202-1			
D103	8-719-107-94	DIODE	1SS202-1			
D201	8-719-000-60	DIODE	UZL-6M2			
D202	8-719-107-94	DIODE	1SS202-1			
D203	8-719-107-94	DIODE	1SS202-1			
D511	8-719-114-29	DIODE	RD5.1JS-B1			
D512	8-719-107-94	DIODE	1SS202-1			
D514	8-719-107-94	DIODE	1SS202-1			
D515	8-719-107-94	DIODE	1SS202-1			
D516	8-719-114-29	DIODE	RD5.1JS-B1			
D517	8-719-107-94	DIODE	1SS202-1			
D522	8-719-107-94	DIODE	1SS202-1			
D523	8-719-933-41	DIODE	HZS6C3L			
D525	8-719-107-94	DIODE	1SS202-1			
D526	8-719-107-94	DIODE	1SS202-1			
D527	8-719-114-29	DIODE	RD5.1JS-B1			
D701	8-719-230-02	DIODE	30DF2			
D702	8-719-230-02	DIODE	30DF2			
D703	8-719-230-02	DIODE	30DF2			
D704	8-719-230-02	DIODE	30DF2			
D705	8-719-200-77	DIODE	10E2N			
D706	8-719-200-77	DIODE	10E2N			
D707	8-719-200-77	DIODE	10E2N			
D708	8-719-200-77	DIODE	10E2N			
D709	8-719-200-77	DIODE	10E2N			
D710	8-719-200-77	DIODE	10E2N			
D711	8-719-107-94	DIODE	1SS202-1			
D712	8-719-107-94	DIODE	1SS202-1			
D751	8-719-200-77	DIODE	10E2N			

RECT.

Ref. No.	Part No.	Description	Remark
D752	8-719-910-25	DIODE HZS12B2L	
D753	8-719-933-39	DIODE HZS6C1L	
D754	8-719-933-41	DIODE HZS6C3L	
D755	8-719-933-39	DIODE HZS6C1L	
D756	8-719-002-33	DIODE UZL-24L	
D757	8-719-200-77	DIODE 10E2N	
D758	8-719-933-39	DIODE HZS6C1L	
D801	8-719-107-94	DIODE 1SS202-1	
D802	8-719-107-94	DIODE 1SS202-1	
		〈 IC 〉	
IC504	8-759-602-83	IC M5238P	
IC505	8-752-018-80	IC CX20188	
IC506	8-759-900-72	IC NE5532P	
IC508	8-759-106-56	IC uPC1297CA	
IC509	8-759-604-86	IC M5F7807	
IC510	8-759-604-90	IC M5F7907	
IC511	8-759-240-50	IC TC4050BP	
IC512	8-759-602-83	IC M5238P	
IC513	8-759-945-58	IC RC4558P	
IC514	8-759-634-51	IC M5218AP	
IC515	8-759-945-58	IC RC4558P	
IC518	8-759-982-26	IC RC78L12A	
IC519	8-759-982-48	IC RC79L12A	
IC801	8-759-635-69	IC M50964-226SP	
IC802	8-759-973-95	IC BA6219B	
IC803	8-759-822-09	IC LB1641	
		〈 COIL 〉	
L101	1-408-920-00	INDUCTOR 4.7mH	
L102	1-408-918-11	INDUCTOR 3.3mH	
L103	1-408-916-11	INDUCTOR 2.2mH	
L104	1-408-925-11	INDUCTOR 12mH	
L105	1-408-916-11	INDUCTOR 2.2mH	
L201	1-408-920-00	INDUCTOR 4.7mH	
L202	1-408-918-11	INDUCTOR 3.3mH	
L203	1-408-916-11	INDUCTOR 2.2mH	
L204	1-408-925-11	INDUCTOR 12mH	
L205	1-408-916-11	INDUCTOR 2.2mH	
L501	1-410-525-11	INDUCTOR 220uH	
L502	1-410-525-11	INDUCTOR 220uH	
L503	1-410-525-11	INDUCTOR 220uH	
		〈 PILOT LAMP 〉	
LP501	1-518-471-31	LAMP, PILOT	
LP502	1-518-471-31	LAMP, PILOT	
		〈 FILTER 〉	
LPF101	1-236-087-11	FILTER, LOW PASS	
LPF201	1-236-087-11	FILTER, LOW PASS	
		〈 IC LINK 〉	
PS701	1-532-685-00	LINK, IC	
PS702	1-532-685-00	LINK, IC	
		〈 TRANSISTOR 〉	
Q107	8-729-142-25	TRANSISTOR 2SD1020TP-HFE	
Q108	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q109	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q110	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q111	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q112	8-729-900-80	TRANSISTOR DTC114ES	
Q113	8-729-900-80	TRANSISTOR DTC114ES	
Q114	8-729-900-80	TRANSISTOR DTC114ES	
Q116	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q117	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q118	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q207	8-729-142-25	TRANSISTOR 2SD1020-HFE	
Q208	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q209	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q210	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q211	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q212	8-729-900-80	TRANSISTOR DTC114ES	
Q213	8-729-900-80	TRANSISTOR DTC114ES	
Q214	8-729-900-80	TRANSISTOR DTC114ES	
Q216	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q217	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q218	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q517	8-729-900-61	TRANSISTOR DTA114ES	
Q518	8-729-281-53	TRANSISTOR 2SC1815-GR	
Q519	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q520	8-729-900-36	TRANSISTOR DTC124ES	
Q522	8-729-141-30	TRANSISTOR 2SC3623ATP-LK	
Q523	8-729-141-30	TRANSISTOR 2SC3623ATP-LK	
Q524	8-729-141-30	TRANSISTOR 2SC3623ATP-LK	
Q529	8-729-141-30	TRANSISTOR 2SC3623ATP-LK	
Q530	8-729-141-30	TRANSISTOR 2SC3623ATP-LK	
Q533	8-729-900-36	TRANSISTOR DTC124ES	
Q534	8-729-900-74	TRANSISTOR DTC143TS	
Q535	8-729-900-36	TRANSISTOR DTC124ES	
Q536	8-729-900-36	TRANSISTOR DTC124ES	
Q539	8-729-900-36	TRANSISTOR DTC124ES	
Q540	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q701	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q751	8-729-924-90	TRANSISTOR 2SB1370-EF	
Q752	8-729-924-90	TRANSISTOR 2SB1370-EF	
Q753	8-729-111-55	TRANSISTOR 2SD2061-EF	
Q754	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q755	8-729-140-97	TRANSISTOR 2SB734-34	
Q756	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q757	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q758	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q759	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q801	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q802	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q803	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q804	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q805	8-729-900-61	TRANSISTOR DTA114ES	
Q806	8-729-900-61	TRANSISTOR DTA114ES	
Q807	8-729-900-61	TRANSISTOR DTA114ES	
Q808	8-729-900-61	TRANSISTOR DTA114ES	
Q809	8-729-900-65	TRANSISTOR DTA144ES	
Q810	8-729-900-65	TRANSISTOR DTA144ES	
Q811	8-729-900-65	TRANSISTOR DTA144ES	
Q812	8-729-900-65	TRANSISTOR DTA144ES	
Q813	8-729-900-65	TRANSISTOR DTA144ES	
Q814	8-729-900-65	TRANSISTOR DTA144ES	
Q815	8-729-900-61	TRANSISTOR DTA114ES	
Q816	8-729-900-61	TRANSISTOR DTA114ES	

RECT.

Ref. No.	Part No.	Description				Remark
		⟨ RESISTOR ⟩				
R138	1-249-469-11	CARBON	100K	5%	1/4W	
R139	1-247-723-11	CARBON	6.8K	5%	1/4W	
R140	1-247-720-11	CARBON	3.9K	5%	1/4W	
R141	1-247-719-11	CARBON	3.3K	5%	1/4W	
R142	1-247-152-00	CARBON	7.5K	5%	1/4W	
R143	1-249-469-11	CARBON	100K	5%	1/4W	
R144	1-247-747-11	CARBON	470	5%	1/2W	
R145	1-247-764-11	CARBON	10K	5%	1/2W	
R146	1-247-146-00	CARBON	4.3K	5%	1/4W	
R147	1-247-142-00	CARBON	3K	5%	1/4W	
R148	1-247-710-11	CARBON	560	5%	1/4W	
R149	1-246-545-00	CARBON	1.0M	5%	1/4W	
R150	1-249-462-11	CARBON	22K	5%	1/4W	
R151	1-247-152-00	CARBON	7.5K	5%	1/4W	
R152	1-247-711-11	CARBON	680	5%	1/4W	
R153	1-247-154-00	CARBON	9.1K	5%	1/4W	
R154	1-249-465-11	CARBON	47K	5%	1/4W	
R161	1-247-719-11	CARBON	3.3K	5%	1/4W	
R162	1-247-723-11	CARBON	6.8K	5%	1/4W	
R163	1-249-590-11	CARBON	39K	5%	1/4W	
R164	1-249-425-11	CARBON	4.7K	5%	1/4W	
R165	1-249-429-11	CARBON	10K	5%	1/4W	
R166	1-249-465-11	CARBON	47K	5%	1/4W	
R167	1-247-716-11	CARBON	1.8K	5%	1/4W	
R168	1-249-598-11	CARBON	82K	5%	1/4W	
R169	1-259-467-11	CARBON	43K	5%	1/4W	
R170	1-247-702-11	CARBON	150	5%	1/4W	
R171	1-247-154-00	CARBON	9.1K	5%	1/4W	
R172	1-249-429-11	CARBON	10K	5%	1/4W	
R173	1-247-701-11	CARBON	120	5%	1/4W	
R174	1-247-142-00	CARBON	3K	5%	1/4W	
R175	1-247-721-11	CARBON	4.7K	5%	1/4W	
R176	1-249-429-11	CARBON	10K	5%	1/4W	
R177	1-247-700-11	CARBON	100	5%	1/4W	
R178	1-247-719-11	CARBON	3.3K	5%	1/4W	
R179	1-247-719-11	CARBON	3.3K	5%	1/4W	
R180	1-249-429-11	CARBON	10K	5%	1/4W	
R185	1-247-718-11	CARBON	2.7K	5%	1/4W	
R186	1-247-883-00	CARBON	150K	5%	1/4W	
R187	1-247-714-11	CARBON	1.2K	5%	1/4W	
R188	1-247-714-11	CARBON	1.2K	5%	1/4W	
R189	1-249-425-11	CARBON	4.7K	5%	1/4W	
R194	1-247-883-00	CARBON	150K	5%	1/4W	
R195	1-249-417-11	CARBON	1K	5%	1/4W	
R197	1-249-408-11	CARBON	180	5%	1/4W	
R198	1-249-414-11	CARBON	560	5%	1/4W	
R199	1-249-417-11	CARBON	1K	5%	1/4W	
R238	1-249-469-11	CARBON	100K	5%	1/4W	
R239	1-247-723-11	CARBON	6.8K	5%	1/4W	
R240	1-247-720-11	CARBON	3.9K	5%	1/4W	
R241	1-247-719-11	CARBON	3.3K	5%	1/4W	
R242	1-247-152-00	CARBON	7.5K	5%	1/4W	
R243	1-249-469-11	CARBON	100K	5%	1/4W	
R244	1-247-747-11	CARBON	470	5%	1/2W	
R245	1-247-764-11	CARBON	10K	5%	1/2W	
R246	1-247-146-00	CARBON	4.3K	5%	1/4W	
R247	1-247-142-00	CARBON	3K	5%	1/4W	
R248	1-247-710-11	CARBON	560	5%	1/4W	

Ref. No.	Part No.	Description				Remark
R249	1-246-545-00	CARBON	1.0M	5%	1/4W	
R250	1-249-462-11	CARBON	22K	5%	1/4W	
R251	1-247-152-00	CARBON	7.5K	5%	1/4W	
R252	1-247-711-11	CARBON	680	5%	1/4W	
R253	1-247-154-00	CARBON	9.1K	5%	1/4W	
R254	1-249-465-11	CARBON	47K	5%	1/4W	
R261	1-247-719-11	CARBON	3.3K	5%	1/4W	
R262	1-247-723-11	CARBON	6.8K	5%	1/4W	
R263	1-249-590-11	CARBON	39K	5%	1/4W	
R264	1-249-425-11	CARBON	4.7K	5%	1/4W	
R265	1-249-429-11	CARBON	10K	5%	1/4W	
R266	1-249-465-11	CARBON	47K	5%	1/4W	
R267	1-247-716-11	CARBON	1.8K	5%	1/4W	
R268	1-249-598-11	CARBON	82K	5%	1/4W	
R269	1-259-467-11	CARBON	43K	5%	1/4W	
R270	1-247-702-11	CARBON	150	5%	1/4W	
R271	1-247-154-00	CARBON	9.1K	5%	1/4W	
R272	1-249-429-11	CARBON	10K	5%	1/4W	
R273	1-247-701-11	CARBON	120	5%	1/4W	
R274	1-247-142-00	CARBON	3K	5%	1/4W	
R275	1-247-721-11	CARBON	4.7K	5%	1/4W	
R276	1-249-429-11	CARBON	10K	5%	1/4W	
R277	1-247-700-11	CARBON	100	5%	1/4W	
R278	1-247-719-11	CARBON	3.3K	5%	1/4W	
R279	1-247-719-11	CARBON	3.3K	5%	1/4W	
R280	1-249-429-11	CARBON	10K	5%	1/4W	
R285	1-247-718-11	CARBON	2.7K	5%	1/4W	
R286	1-247-883-00	CARBON	150K	5%	1/4W	
R287	1-247-714-11	CARBON	1.2K	5%	1/4W	
R288	1-247-714-11	CARBON	1.2K	5%	1/4W	
R289	1-249-425-11	CARBON	4.7K	5%	1/4W	
R294	1-247-883-00	CARBON	150K	5%	1/4W	
R295	1-249-417-11	CARBON	1K	5%	1/4W	
R296	1-215-472-00	METAL	130K	1%	1/6W	
R297	1-249-408-11	CARBON	180	5%	1/4W	
R298	1-249-414-11	CARBON	560	5%	1/4W	
R299	1-249-417-11	CARBON	1K	5%	1/4W	
R301	1-249-428-11	CARBON	8.2K	5%	1/4W	
R302	1-249-417-11	CARBON	1K	5%	1/4W	
R303	1-247-725-11	CARBON	10K	5%	1/4W	
R304	1-249-429-11	CARBON	10K	5%	1/4W	
R305	1-249-429-11	CARBON	10K	5%	1/4W	
R306	1-249-417-11	CARBON	1K	5%	1/4W	
R307	1-249-437-11	CARBON	47K	5%	1/4W	
R308	1-215-465-00	METAL	68K	1%	1/6W	
R309	1-215-474-00	METAL	160K	1%	1/6W	
R310	1-215-448-00	METAL	13K	1%	1/6W	
R311	1-249-408-11	CARBON	180	5%	1/4W	
R312	1-247-883-00	CARBON	150K	5%	1/4W	
R314	1-249-423-11	CARBON	3.3K	5%	1/4W	
R316	1-249-425-11	CARBON	4.7K	5%	1/4W	
R317	1-249-429-11	CARBON	10K	5%	1/4W	
R318	1-249-616-11	CARBON	470K	5%	1/4W	
R319	⚠1-212-857-00	FUSIBLE	10	5%	1/4W	F
R320	1-249-465-11	CARBON	47K	5%	1/4W	
R401	1-249-428-11	CARBON	8.2K	5%	1/4W	
R402	1-249-417-11	CARBON	1K	5%	1/4W	
R403	1-247-725-11	CARBON	10K	5%	1/4W	
R404	1-249-429-11	CARBON	10K	5%	1/4W	
R405	1-249-429-11	CARBON	10K	5%	1/4W	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

RECT.

Ref. No.	Part No.	Description				Remark
R406	1-249-417-11	CARBON	1K	5%	1/4W	
R407	1-249-437-11	CARBON	47K	5%	1/4W	
R408	1-215-465-00	METAL	68K	1%	1/6W	
R409	1-215-474-00	METAL	160K	1%	1/6W	
R410	1-215-448-00	METAL	13K	1%	1/6W	
R411	1-249-408-11	CARBON	180	5%	1/4W	
R412	1-247-883-00	CARBON	150K	5%	1/4W	
R414	1-249-423-11	CARBON	3.3K	5%	1/4W	
R416	1-249-425-11	CARBON	4.7K	5%	1/4W	
R417	1-249-429-11	CARBON	10K	5%	1/4W	
R418	1-249-616-11	CARBON	470K	5%	1/4W	
R419	⚠1-212-857-00	FUSIBLE	10	5%	1/4W	F
R420	1-249-465-11	CARBON	47K	5%	1/4W	
R531	1-249-438-11	CARBON	56K	5%	1/4W	
R532	1-249-433-11	CARBON	22K	5%	1/4W	
R533	1-249-421-11	CARBON	2.2K	5%	1/4W	
R537	1-249-417-11	CARBON	1K	5%	1/4W	
R538	1-249-425-11	CARBON	4.7K	5%	1/4W	
R539	1-249-437-11	CARBON	47K	5%	1/4W	
R540	1-249-433-11	CARBON	22K	5%	1/4W	
R542	1-249-429-11	CARBON	10K	5%	1/4W	
R543	1-249-424-11	CARBON	3.9K	5%	1/4W	
R544	1-249-418-11	CARBON	1.2K	5%	1/4W	
R545	1-249-428-11	CARBON	8.2K	5%	1/4W	
R546	1-249-429-11	CARBON	10K	5%	1/4W	
R547	1-249-405-11	CARBON	100	5%	1/4W	
R548	1-249-405-11	CARBON	100	5%	1/4W	
R549	1-249-405-11	CARBON	100	5%	1/4W	
R550	1-249-405-11	CARBON	100	5%	1/4W	
R551	1-249-405-11	CARBON	100	5%	1/4W	
R552	1-249-405-11	CARBON	100	5%	1/4W	
R553	1-249-429-11	CARBON	10K	5%	1/4W	
R554	1-249-429-11	CARBON	10K	5%	1/4W	
R556	1-249-428-11	CARBON	8.2K	5%	1/4W	
R557	1-247-856-00	CARBON	11K	5%	1/4W	
R558	1-249-397-11	CARBON	22	5%	1/4W	
R559	1-249-407-11	CARBON	150	5%	1/4W	
R560	1-247-856-00	CARBON	11K	5%	1/4W	
R561	1-249-428-11	CARBON	8.2K	5%	1/4W	
R562	1-249-432-11	CARBON	18K	5%	1/4W	
R563	1-249-397-11	CARBON	22	5%	1/4W	
R564	1-249-407-11	CARBON	150	5%	1/4W	
R565	1-249-432-11	CARBON	18K	5%	1/4W	
R566	1-247-887-00	CARBON	220K	5%	1/4W	
R567	1-247-887-00	CARBON	220K	5%	1/4W	
R568	1-249-407-11	CARBON	150	5%	1/4W	
R569	1-249-422-11	CARBON	2.7K	5%	1/4W	
R572	1-249-429-11	CARBON	10K	5%	1/4W	
R573	1-249-439-11	CARBON	68K	5%	1/4W	
R575	1-249-429-11	CARBON	10K	5%	1/4W	
R576	1-249-429-11	CARBON	10K	5%	1/4W	
R583	1-249-417-11	CARBON	1K	5%	1/4W	
R584	1-249-437-11	CARBON	47K	5%	1/4W	
R587	1-249-437-11	CARBON	47K	5%	1/4W	
R701	⚠1-212-861-11	FUSIBLE	15	5%	1/4W	F
R702	1-249-436-11	CARBON	39K	5%	1/4W	
R703	1-249-439-11	CARBON	68K	5%	1/4W	
R751	1-249-421-11	CARBON	2.2K	5%	1/4W	
R752	1-249-425-11	CARBON	4.7K	5%	1/4W	
R753	1-249-437-11	CARBON	47K	5%	1/4W	

Ref. No.	Part No.	Description				Remark
R754	1-249-437-11	CARBON	47K	5%	1/4W	
R755	1-249-421-11	CARBON	2.2K	5%	1/4W	
R756	1-249-425-11	CARBON	4.7K	5%	1/4W	
R757	1-249-437-11	CARBON	47K	5%	1/4W	
R758	1-249-422-11	CARBON	2.7K	5%	1/4W	
R759	1-249-427-11	CARBON	6.8K	5%	1/4W	
R760	1-249-425-11	CARBON	4.7K	5%	1/4W	
R761	1-249-437-11	CARBON	47K	5%	1/4W	
R762	1-249-421-11	CARBON	2.2K	5%	1/4W	
R763	1-249-441-11	CARBON	100K	5%	1/4W	
R764	1-249-425-11	CARBON	4.7K	5%	1/4W	
R765	1-249-437-11	CARBON	47K	5%	1/4W	
R766	1-249-437-11	CARBON	47K	5%	1/4W	
R767	1-249-429-11	CARBON	10K	5%	1/4W	
R768	1-249-437-11	CARBON	47K	5%	1/4W	
R769	1-249-437-11	CARBON	47K	5%	1/4W	
R770	1-249-433-11	CARBON	22K	5%	1/4W	
R771	1-249-395-11	CARBON	15	5%	1/4W	
R772	1-249-395-11	CARBON	15	5%	1/4W	
R773	⚠1-219-136-11	FUSIBLE	0.22	10%	1/4W	
R774	⚠1-219-136-11	FUSIBLE	0.22	10%	1/4W	
R775	⚠1-219-136-11	FUSIBLE	0.22	10%	1/4W	
R776	1-249-413-11	CARBON	470	5%	1/4W	
R801	⚠1-249-482-11	CARBON	4.7	5%	1/2W	F
R802	1-249-425-11	CARBON	4.7K	5%	1/4W	
R803	1-249-425-11	CARBON	4.7K	5%	1/4W	
R804	1-249-426-11	CARBON	5.6K	5%	1/4W	
R805	1-247-856-00	CARBON	11K	5%	1/4W	
R806	1-249-425-11	CARBON	4.7K	5%	1/4W	
R807	⚠1-249-482-11	CARBON	4.7	5%	1/2W	F
R808	1-249-425-11	CARBON	4.7K	5%	1/4W	
R809	1-249-425-11	CARBON	4.7K	5%	1/4W	
R810	1-249-426-11	CARBON	5.6K	5%	1/4W	
R811	1-249-429-11	CARBON	10K	5%	1/4W	
R812	1-249-425-11	CARBON	4.7K	5%	1/4W	
R813	1-249-429-11	CARBON	10K	5%	1/4W	
R814	1-249-429-11	CARBON	10K	5%	1/4W	
R815	1-249-429-11	CARBON	10K	5%	1/4W	
R816	1-249-429-11	CARBON	10K	5%	1/4W	
R817	1-249-429-11	CARBON	10K	5%	1/4W	
R818	1-249-429-11	CARBON	10K	5%	1/4W	
R819	1-249-429-11	CARBON	10K	5%	1/4W	
R820	1-249-429-11	CARBON	10K	5%	1/4W	
R821	1-249-429-11	CARBON	10K	5%	1/4W	
R822	1-249-429-11	CARBON	10K	5%	1/4W	
R823	1-249-429-11	CARBON	10K	5%	1/4W	
R824	1-249-405-11	CARBON	100	5%	1/4W	
R825	1-249-405-11	CARBON	100	5%	1/4W	
R826	1-249-405-11	CARBON	100	5%	1/4W	
R827	1-249-405-11	CARBON	100	5%	1/4W	
R828	1-249-405-11	CARBON	100	5%	1/4W	
R829	1-249-405-11	CARBON	100	5%	1/4W	
R830	1-249-405-11	CARBON	100	5%	1/4W	
R831	1-249-405-11	CARBON	100	5%	1/4W	
R832	1-249-405-11	CARBON	100	5%	1/4W	
R833	1-249-405-11	CARBON	100	5%	1/4W	
R834	1-249-405-11	CARBON	100	5%	1/4W	
R835	1-249-425-11	CARBON	4.7K	5%	1/4W	
R836	1-249-417-11	CARBON	1K	5%	1/4W	
R837	1-249-435-11	CARBON	33K	5%	1/4W	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

RECT.

Ref. No.	Part No.	Description				Remark
R838	1-249-435-11	CARBON	33K	5%	1/4W	
R839	1-247-903-00	CARBON	1M	5%	1/4W	
R840	1-249-429-11	CARBON	10K	5%	1/4W	
R841	1-249-405-11	CARBON	100	5%	1/4W	
R842	1-249-405-11	CARBON	100	5%	1/4W	
R843	1-249-405-11	CARBON	100	5%	1/4W	
R844	1-249-405-11	CARBON	100	5%	1/4W	
R845	1-249-429-11	CARBON	10K	5%	1/4W	
R846	1-249-429-11	CARBON	10K	5%	1/4W	
R847	1-249-427-11	CARBON	6.8K	5%	1/4W	
R848	1-249-429-11	CARBON	10K	5%	1/4W	
R849	1-249-429-11	CARBON	10K	5%	1/4W	
R850	1-249-429-11	CARBON	10K	5%	1/4W	
R851	1-249-429-11	CARBON	10K	5%	1/4W	
R852	1-249-413-11	CARBON	470	5%	1/4W	
R853	1-249-412-11	CARBON	390	5%	1/4W	
R854	1-249-410-11	CARBON	270	5%	1/4W	
R855	1-249-436-11	CARBON	39K	5%	1/4W	
R856	1-249-436-11	CARBON	39K	5%	1/4W	
R857	1-249-405-11	CARBON	100	5%	1/4W	
R858	1-249-405-11	CARBON	100	5%	1/4W	
R859	1-249-405-11	CARBON	100	5%	1/4W	
R860	1-249-405-11	CARBON	100	5%	1/4W	
R861	1-249-429-11	CARBON	10K	5%	1/4W	
R862	1-249-429-11	CARBON	10K	5%	1/4W	
R863	1-249-441-11	CARBON	100K	5%	1/4W	
R864	1-249-441-11	CARBON	100K	5%	1/4W	
R865	1-249-441-11	CARBON	100K	5%	1/4W	
R866	1-249-441-11	CARBON	100K	5%	1/4W	
R867	1-249-441-11	CARBON	100K	5%	1/4W	
R868	1-249-441-11	CARBON	100K	5%	1/4W	
		〈 VARIABLE RESISTOR 〉				
RV102	1-224-251-XX	RES, ADJ, METAL GLAZE 4.7K				
RV103	1-238-011-11	RES, ADJ, CARBON 470				
RV104	1-238-597-11	RES, ADJ, CARBON 1K				
RV105	1-238-600-11	RES, ADJ, CARBON 10K				
RV106	1-238-600-11	RES, ADJ, CARBON 10K				
RV107	1-238-600-11	RES, ADJ, CARBON 10K				
RV108	1-238-601-11	RES, ADJ, CARBON 22K				
RV202	1-224-251-XX	RES, ADJ, METAL GLAZE 4.7K				
RV203	1-238-011-11	RES, ADJ, CARBON 470				
RV204	1-238-597-11	RES, ADJ, CARBON 1K				
RV205	1-238-600-11	RES, ADJ, CARBON 10K				
RV206	1-238-600-11	RES, ADJ, CARBON 10K				
RV207	1-238-600-11	RES, ADJ, CARBON 10K				
RV208	1-238-601-11	RES, ADJ, CARBON 22K				
RV504	1-241-231-11	RES, ADJ, CARBON 100				
RV505	1-241-231-11	RES, ADJ, CARBON 100				
RV801	1-238-598-11	RES, ADJ, CARBON 2.2K				
		〈 RELAY 〉				
RY502	1-515-803-11	RELAY				
RY503	1-515-614-11	RELAY				
		〈 TRANSFORMER 〉				
T101	1-433-361-11	TRANSFORMER, BIAS OSCILLATION				
T201	1-433-361-11	TRANSFORMER, BIAS OSCILLATION				

Ref. No.	Part No.	Description	Remark
		〈 THERMISTOR 〉	
TH501	1-202-855-00	THERMISTOR (POSITIVE)	
		〈 TEST PIN 〉	
TP1	＊ 1-535-115-00	TERMINAL	
TP801	＊ 1-564-337-00	PIN, CONNECTOR 3P	
		〈 VIBRATOR 〉	
X801	1-577-358-21	VIBRATOR, CERAMIC	
**********			
		MISCELLANEOUS	
		**********	
112	1-559-297-32	CORD, POWER (K333ESL:E)	
112	1-574-383-11	CORD, POWER (K970ES)	
119	1-569-007-11	ADAPTER, CONVERSION 2P (K333ESL:E)	
196	＊ 1-608-268-00	PC BOARD, ERASE HEAD	
257	1-632-779-11	PC BOARD, FG	
F701	1-532-286-00	FUSE, TIME-LAG (2.5A)	
F702	1-532-286-00	FUSE, TIME-LAG (2.5A)	
HE501	1-543-358-11	HEAD, MAGNETIC (ERASE)	
HRP501	1-543-684-11	HEAD, MAGNETIC (REC/PB)	
M1001	X-3356-638-1	MOTOR (REEL R) ASSY	
M1002	X-3356-604-1	MOTOR (ASSIST) ASSY	
S1001	1-466-238-11	ENCODER, ROTARY	
S702	1-157-009-11	SELECTOR, VOLTAGE	
T701	⚠1-450-451-11	TRANSFORMER, POWER (K970ES)	
T701	⚠1-450-453-11	TRANSFORMER, POWER (K333ESL:E)	
**********			
		ACCESSORY & PACKING MATERIAL	
		**********	
	1-465-314-11	REMOTE COMMANDER (K333ESL:E)	
	2-181-754-01	COVER, BATTERY (K333ESL:E)	
	1-558-271-11	CORD, CONNECTION	
	＊ 3-350-465-01	CUSHION	
	＊ 3-367-121-01	INDIVIDUAL CARTON (K970ES)	
	＊ 3-367-122-01	INDIVIDUAL CARTON (K333ESL:E)	
	3-367-548-11	LABEL, MODEL NUMBER (AE)	
	3-752-611-11	MANUAL, INSTRUCTION (English, French, Spanish, Portuguese)	
	3-752-611-41	MANUAL, INSTRUCTION (K970ES: German, Datch, Swedish, Italian)	
	3-793-481-13	INSTRUCTION	
	4-847-802-00	SCREW	
**********			

HARDWARE LIST

****

Ref. No.	Part No.	Description	Remark
# 1	7-682-547-04	SCREW +BVTT 3X6 (S)	
# 2	7-682-562-09	SCREW +BVTT 4X10 (S)	
# 3	7-682-548-04	SCREW, TIGHT, S	
# 4	7-685-870-01	SCREW +BVTT 3X5 (S)	
# 5	7-682-547-09	SCREW +BV 3X6, S TIGHT	
# 6	7-685-645-79	SCREW +BVTP 3X6 TYPE2 SLIT	
# 7	7-682-549-04	SCREW +BVTT 3X10 (S)	
# 8	7-682-147-15	SCREW, TR	
# 9	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
# 10	7-682-560-04	SCREW +BVTT 4X6 (S) (K333ESL:E)	
# 11	7-621-772-10	SCREW +B 2X4	
# 12	7-621-772-70	SCREW +B 2X14	
# 13	7-621-775-10	SCREW +B 2.6X4	
# 14	7-622-205-05	NUT M2 TYPE2	
# 15	7-628-253-00	SCREW +PS 2X4	
# 16	7-628-254-10	SCREW +PS 2.6X6	
# 17	7-671-154-01	STENLESS BALL	
# 18	7-682-648-09	SCREW +PS 3X8	
# 19	7-685-133-19	SCREW +BTP 2.6X6 TYPE2 N-S	
# 20	7-621-255-20	SCREW +BVTT 2X4 (S)	
# 21	7-621-255-35	SCREW +BVTT 2X5 (S)	
# 22	7-685-870-01	SCREW +BVTT 3X5 (S)	

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Sony Corporation
Audio Group

TC-K333ESL/K970ES

SONY
SERVICE MANUAL

AEP Model
TC-K970ES

E Model
TC-K333ESL

SUPPLEMENT-1

File this Supplement with the Service Manual.

Subject : The gold type of TC-K970ES has been added.

- The gold type is the same as black type except for the parts as shown in the table.
- Use this manual for servicing the gold-type set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

page	BLACK TYPE		GOLD TYPE	
	Ref. No	Part. No	Part. No	Description
43	2	3-364-438-21	3-364-438-31	WINDOW, CASSETTE
	4	X-3362-818-1	X-3363-490-1	KNOB (DIA, 12) ASSY (B), SQUARE
	5	3-364-475-31	3-364-475-41	PANEL, FRONT
	7	4-908-848-01	4-908-848-21	EMBLEM, SONY
	8	4-908-044-11	4-908-044-21	ESCUTCHEON, POWER KNOB
	9	3-364-444-01	4-908-444-11	ESCUTCHEON (L)
	10	3-364-442-11	3-364-442-21	WINDOW, COUNTER
	12	3-364-443-01	3-364-443-11	WINDOW, METER
	13	3-364-447-01	3-364-447-11	ESCUTCHEON (R)
	15	X-3304-959-1	X-3363-492-2	PANEL (LEFT) ASSY, SIDE
	16	4-923-474-01	4-928-025-41	RING, ORNAMENTAL
	17	3-704-366-01	3-704-366-11	SCREW (CASE) (M3 × 8)
	18	*3-350-489-11	*3-350-489-21	CASE
	19	X-3304-960-1	X-3363-493-2	PANEL (RIGHT) ASSY, SIDE
	21	X-3304-944-1	X-3363-489-1	FOOT ASSY
44	51	*3-364-474-01	*3-364-474-12	PANEL (BASE)
	52	4-922-518-11	4-922-518-62	KNOB (TIMER)
	53	4-908-046-01	4-908-046-81	KNOB, SQUARE
	64	X-3362-327-1	X-3363-491-1	BUTTON ASSY
	70	3-364-441-01	3-364-441-11	BUTTON
	71	3-364-440-01	3-364-440-11	KNOB (L)
	72	3-364-439-01	3-364-439-11	KNOB (R)
45	116	*3-350-482-21	*3-350-482-41	PANEL BACK (K970ES)

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TC-K333ESL/K970ES

SONY
SERVICE MANUAL

AEP Model
TC-K970ES
E Model
TC-K333ESL

CORRECTION-1

Correct your service manual as shown below.

☛ : indicates corrected portion.

Page	INCORRECT	CORRECT
58	Ref No. Part No. Description RY503 1-515-614-11 RELAY	Ref No. Part No. Description RY503 1-515-803-11 RELAY ☛

9-956-283-91

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